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A REVISED AND CONSOLIDATED WORKING PLAN FOR THE FORESTS OF THE COIMBATORE (SOUTH) DIVISION

1941-42 TO 1950-51

BY
SRI RAO BAHADUR T. V. VENKATESWARA AYYAR, M.A.
Assistant Conservator of Forests and Working Plans Officer

UNDER THE DIRECTION OF
THE CHIEF CONSERVATOR OF FORESTS
MADRAS

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NOTE

In this Working Plan the whole of Part I and the first XI chapters of Part II were drafted by the author who proceeded on leave on 2nd September 1940. The drafting of other matter, the supervision of the preparation of final copies of the Working Plan maps, the revision of the extraction scheme proposed for Kallar valley and the task of getting the Working Plan ready for approval, devolved upon others who looked after these works in addition to their regular work. No amount has been debited to the cost of the preparation of the Working Plan on account of this.

Coimbatore,
27*th May* 1941.

V. S. KRISHNASWAMY,
Working Plans Officer, No. 2 division.

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A CONSOLIDATED WORKING PLAN FOR THE FORESTS OF COIMBATORE (SOUTH) DIVISION (1941-42 to 1950-51)

PART I

Summary of facts on which the proposals are based.

CHAPTER I.—THE TRACT DEALT WITH.

SECTION 1.—NAME AND SITUATION.

1. *General.*—This working plan covers all the reserved forests of the Coimbatore (South) Division, their total area being 254,832 acres or about 398 square miles. An area of 5 square miles has been excluded, however, as it is managed by panchayats.

The plan revises Mr. Laurie's Revised Working Plan for the Mount Stuart forests (1931–32 to 1940–41) and Mr. Sarma's Working Plan for the forests of Coimbatore (South) Division (1935–36 to 1944–45), and consolidates them into one.

2. *Location.*—The tract dealt with lies within the taluks of Palghat (Malabar district), Pollachi and Udumalpet (Coimbatore district). It comprises four forest ranges—Udumalpet, Pollachi, Punachi and Tunacadavu.

3. *Boundaries.*—The area is bounded by north latitude 10° 12′ and 10° 35′ and east longitudes 76° 44′ 30″ and 77° 22′ 0″. On the north are the cultivated plains of Coimbatore district; the east is bounded by the forests of the Madura division; while on the south and west lie the forest tracts of Malabar, Cochin and Travancore.

SECTION 2.—CONFIGURATION OF THE GROUND.

4. *Altitudes.*—" The forests are situated immediately south of the Palghat gap, on spurs of the western ghats commonly known as the ' Anamalais ' (Elephant hills). The altitude varies from 1,200 feet (on the plains)—the general elevation of the Palghat gap—to about 8,250 feet above the sea." [Akkamalai 8,143 feet; Thanakamalai 8,244 feet.]

5. *Topography.*—" A central range of hills extends from north-west to south-east; from this range, a series of spurs extend approximately to the north ending abruptly in sheer cliffs on the Coimbatore plateau but grading more easily into the Palghat gap on the north-western extremity of these forests. On the south-west of the central spur the gradient is more gentle: the country is an undulating plateau with an elevation of 3,000 to 4,500 feet, now almost entirely taken up for the cultivation of products such as coffee, teak, cardamoms and cinchona." [A. N. Sarma.] The north-western portion draining westwards consists of low undulating hills, much broken up by streams. Tekkadi, Mount Stuart, Ulandi and Palakadavu blocks, rich in teak and rosewood, lie in this portion of the tract.

6. *Aspects.*—" All aspects are found in this block of hills, and streams flow in all directions. An area of 113 square miles drains east through the Amaravathi river which joins the Cauvery draining into the Bay of Bengal. The rest drains into the Arabian sea, partly through the tributaries of the Periyar and Chalakudi streams in Cochin State and partly through the Aliar and Anamalai streams which flow through the Coimbatore district to join the Ponnani river (Bharata puzha) flowing into the Arabian sea. An extent of 159 square miles forms the catchment area of the streams flowing immediately into the Coimbatore district. These streams support extensive areas of irrigated crops; the forests are therefore of great importance for the indirect benefits they confer by the conservation of water." [A. N. Sarma.]

SECTION 3.—GEOLOGY, ROCK AND SOIL.

7. *Rocks.*—The underlying rock is gneiss. The minerals commonly found are felspar, hornblende, biotite, garnet and black mica, but they are not of direct economic importance.

8. *Soil.*—The disintegration of the gneiss is rapid in regions of high rainfall towards the south and west. A rich sandy loam results suitable for teak where conditions are not favourable for the existence of a tropical evergreen type of forest. Some areas towards the west contain disintegrated laterite not well suited for teak, but on which *Xylia xylocarpa*

flourishes, in places almost pure. The drainage is generally good, though there are flat swampy places at the bottoms of the valleys which are unsuitable for teak.

Where the rainfall is 150 inches or more, as in the Anamalai tea plantations, the potash and phosphoric acid in the soil tend to leach out unless soil cover is retained. In the dry areas towards the east (Udumalpet range) the soil is coarse, containing a high proportion of quartz. The humus content is also low.

SECTION 4.—RAINFALL AND CLIMATE.

9. *Rainfall.*—Of all the forest divisions in the Presidency, the Coimbatore (South) Forest Division perhaps exhibits the widest variation in annual rainfall among its different parts. The annual precipitation is as low as 20 inches in the plains on the north-east while over 200 inches fall on the hills to the extreme south-west.

10. *Distribution of rainfall.*—For areas in which the total annual rainfall exceeds about 60 inches, the south-west monsoon brings in the greater part of the rain from June to August. Where the annual rainfall is below that figure, the north-east monsoon is the more prominent of the two and October, November and December record the heaviest falls. Thunder showers are usual in April and May. September is usually a month of light fall, as it lies between the two monsoons.

11. *Rainfall statement.*—A statement showing the average monthly rainfall of important stations is given below :—

Statement showing the average monthly and annual rainfall, in inches.

Name of station.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Annual.	Remarks.
1 High forest ..	1·0	1·1	4·0	7·4	15·5	51·6	57·7	36·3	20·6	21·2	7·8	1·7	225·9	1933–39
2 Pannaimedu ..	0·8	0·9	2·4	5·7	10·5	34·7	54·7	34·4	15·9	16·4	6·7	2·1	185·2	1920–39
3 Cinchona	0·9	1·4	2·3	5·6	10·8	30·2	31·1	34·1	14·3	15·0	6·9	1·5	164·1	1926–39
4 Iyerpadi	1·0	0·4	1·7	4·4	8·4	25·2	34·0	16·2	11·9	12·3	7·4	1·3	124·2	1924–39
5 Villoni	0·5	0·5	1·4	5·1	7·2	23·0	31·2	23·0	12·3	11·3	6·8	1·3	123·6	1921–39
6 Palakadavu ..	1·3	0·7	2·1	5·7	6·2	17·9	19·5	11·2	7·9	10·5	5·5	0·7	89·2	1933–39
7 Valparai	0·6	0·4	1·4	4·7	6·8	20·9	30·9	23·0	10·1	10·1	5·5	1·0	115·4	1920–39
8 Waterfall	1·9	0·5	1·6	3·9	5·4	21·3	17·9	14·6	9·5	13·2	7·8	3·8	101·4	1925–39
9 Anaipadi	1·8	0·1	0·9	3·3	8·4	10·0	12·2	11·1	6·8	9·8	6·7	1·2	72·3	1929–39
10 Topslip	0·7	1·1	0·9	2·7	4·7	9·9	12·1	8·3	5·1	9·2	7·2	2·6	64·5	1928–39
11 Gundrau (Lower Punachi).	2·1	0·5	0·8	2·2	9·4	7·1	7·6	5·5	4·6	10·7	8·2	3·7	62·4	1929–39
12 Sethumadai ..	0·6	0·3	0·6	1·9	2·1	6·5	7·6	3·6	2·2	6·6	4·3	1·4	37·7	1920–39
13 Isalammanthorai ..	0·9	0·2	0·5	1·8	2·3	1·7	0·8	0·7	1·1	6·6	7·3	1·7	25·6	1924–39
14 Mount Stuart ..	3·9	1·2	0·7	4·2	2·4	10·7	19·1	9·8	2·2	5·6	6·6	3·2	69·6	1920–27
15 Kombu	0·8	0·1	0·6	1·7	0·5	1·7	0·4	0·9	1·4	5·1	3·9	3·5	20·6	1924–33
16 Kallapuram ..	0·5	0·2	0·9	0·9	1·2	2·3	0·3	1·0	1·7	5·3	6·3	7·7	28·3	1924–27

12. *Climate.*—Wide variations of annual rainfall (20 inches to 200 inches), elevation (1,000 feet to 8,000 feet) and aspect have resulted in a highly variable climate. The south-western slopes of the hills with an annual rainfall of over 150 inches (the plantation areas round Valparai) have a moist tropical climate passing into a sub-tropical one at higher elevations. The north-western corner, facing the Palghat gap, has a rainfall of about 50 inches and has a tropical monsoon climate, while the north-eastern slopes are dry, the rainfall being about 25 inches.

13. *Temperature.*—The shade temperature during the day varies from 75° to 105° Fahrenheit at the foot of the hills. The night temperatures vary between 65° and 85° Fahrenheit. Temperatures are naturally lower at higher elevations but frost is unknown. At Palakadavu, the days are stifling hot while the nights are often exceptionally chill.

14. *Healthiness.*—Malaria prevails on the hills from December to June, March, April and May being the worst months. At the foot of the hills, July to September are the most feverish. Topslip, the headquarters of Tunacadavu Range, situated on an exposed ridge, is comparatively free from malaria, partly on account of the anti-malarial work carried out in the vicinity and partly owing to the continual wind blowing across the ridge. The subordinates of the range are concentrated there and a motor bus takes them daily to their work and back : this helps to keep them free from fever.

SECTION 5.—WATER-SUPPLY.

15 *At Topslip.*—At Topslip there is a good supply of wholesome water from the reservoir in Karianshola, built in 1927. This supply is normally perennial, but ran short in the summer of 1939, owing to preceding exceptionally dry years. Hence the perennial spring situated below the Anaipadi road in the bend below Topslip was brought into use and water was pumped up to a tank to meet camp requirements.

16. *At Sungam, Anaipadi and Mount Stuart.*—Water-supply is from semi-perennial springs which dry up after January. Wells are being bored now at Anaipadi and Sungam.

17. *Tekkadi.*—A perennial stream nearby gives a small but insufficient supply. A well has been constructed recently.

18. *At Ulandi and Palakadavu.*—The Periyar (at Palakadavu) flows all the year round, as well as its tributary, the Pānāti-ar. A perennial spring near the Anaigundi rest-shed provides a small supply for camping officers. The Ulandipallam, which comes from the Vengolimalai and crosses the Parambikulam path about a mile before it reaches the Cochin boundary, is also perennial.

19. *Other perennial streams.*—The Aliar, the Thorakadavu ar, the Kalar, the Amaravathi and its tributaries (Tenar, Chinnar and Pambar) are the more important perennial streams in the Punachi and Udumalpet Ranges. There are many perennial streams and springs on the Pundi-Mavadap plateau which furnish water to grazing cattle penned in the area. There is no scarcity of water in any of the camping places.

20. *Water for elephants.*—It is generally found necessary to send the working elephants away to Palakadavu (Periyar) or to the Punachi Range for the hot weather, after the middle of March.

SECTION 6.—DISTRIBUTION AND AREA.

21. *Distribution.*—The reserves dealt with form a compact block about forty miles south of Coimbatore.

22. *Area.*—The names of the reserves, their present areas, dates of reservation, etc., are given in the subjoined statement.

Dhali reserve of 639·08 acres was disreserved in Notification No. 1000, dated 26th November 1938.

A notification has been published in the *Fort St. George Gazette*, dated 9th May 1939, under section 4 of the Madras Forest Act, for the reservation of 229 acres of an enclosure in the Amaravathi reserve, since it is in the middle of the reserve and far away from villages, and is infested with wild animals and malaria.

List of reserved forests in Coimbatore South Forest Division.

Name of reserved forest.	Date of reservation.	Authority for reservation.	Area in acres.	Subsequent changes. Reservation. Authority.	Reservation. Area in acres.	Disreservation. Authority.	Disreservation. Area in acres.	Net area in acres in March 1940.
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
VII ..	18th December 1883.	G.O. No. 1612, dated 2nd August 1879, G.O. No. 760, dated 3rd July 1880, and Notification No. 215, dated 27th November 1883, published at page 861 of *Fort St. George Gazette*, dated 21st December 1883. An amended and more accurate description of the boundaries has been sanctioned in G.O. Mis. No. 936, Revenue (Special), dated 26th December 1918 and published at pages 19 and 20 of *Fort St. George Gazette*, dated 7th January 1919.	27,893	Erratum to Notification No. 241, dated 27th July 1927, ordered in notification, dated 28th February 1933, published at page 413 of *Fort St. George Gazette*, dated 7th March 1933— ACS. 3,802·90 −3,577·14 = 225·76	225·76	Notification No. 241, dated 27th July 1927, published at page 1204 of *Fort St. George Gazette*, dated 2nd August 1927. Notification No. 300, dated 22nd August 1933, published at page 1378 of *Fort St. George Gazette*, dated 29th August 1933.	3,802·9 87·28	24,228·58
Tekkadi leased forests.	Do.	Do.	17,242·4	....	..	....	..	17,242·4
Punachi	Do.	Do.	3,140·70	G.O. No. 527, Revenue, dated 8th March 1916, published at page 360 of *Fort St. George Gazette*, dated 23rd May 1916.	88·38	....	..	3,229·08
Amaravathi ..	Do.	Do.	33,350	....	..	Notification No. 362, published at pages 20–23 of *Fort St. George Gazette*, dated 1st December 1925. Notification No. 403, dated 6th December 1926, published at page 2474 of *Fort St. George Gazette*, dated 14th December 1926.	204 25	
				Notification No. 370, dated 1st May 1939, under section 4, published at page 565 of *Fort St. George Gazette*, dated 9th May 1939.	229	....	..	33,350
Manjampatti, Block II.	15th October 1896.	Notification No. 382, dated 19th June 1896.	3,564	....	..	....	..	3,564
Kukkal	..	....	10,739	....	..	....	..	10,739
Kudiraiyar ..	..	....	2,533	....	..	....	..	2,533

Anamalai ..	.. 1st March 1885.	Notification No. 16, dated 15th December 1884, and G.O. No. 1382, Revenue, dated 15th December 1884. An amended and more accurate description of the boundaries has been approved in G.O. Mis. No. 936, Revenue (Special), dated 26th December 1918, and published at pages 19 and 20 of *Fort St. George Gazette*, dated 7th January 1919.	203,439·82	Notification No. 385, dated 2nd September 1901, published at page 1587 of *Fort St. George Gazette*, dated 19th September 1901.	303·09	Notification No. 519, dated 22nd November 1917, published at page 1377 of *Fort St. George Gazette*, dated 11th December 1917.	234	
				Notification No. 162, dated 17th March 1914.	8·56			
				Notification No. 332, dated 19th June 1916, published at page 792 of *Fort St. George Gazette*, dated 18th July 1916.	39·17	Notification No. 104, dated 10th April 1923, published at page 438 of *Fort St. George Gazette*, dated 17th April 1923.	5·95	
				Do.	12·22			
				Do.	3·10			
				Erratum notification, published at page 264 in *Fort St. George Gazette*, dated 5th February 1929.	6·24	Notification No. 329, dated 8th November 1924, published at page 1381 of *Fort St. George Gazette*, dated 8th November 1924.	24·80	
				Erratum notification, published at page 413 of *Fort St. George Gazette*, dated 7th March 1933.	29·25	Notification No. 241, dated 27th July 1927.	35,080·3	
						Notification No. 191, dated 21st June 1928.	0·78	
						Notification, dated 28th February 1933, published at page 413 of *Fort St. George Gazette*, dated 7th March 1933.	850·28	
						Notification No. 300, dated 22nd August 1933, published at page 1378 of *Fort St. George Gazette*, dated 29th August 1933.	7,299·55	
						Notification No. 106, dated 12th March 1934, published at page 694 of *Fort St. George Gazette*, dated 20th March 1934.	236	
						Notification No. 382, dated 8th November 1935, published at page 1532 of *Fort St. George Gazette*, dated 19th November 1935.	151	
						Notification No. 462, dated 14th September 1936.	12·32	159,946·47

Total area of the division : 254,832·53 acres or 398 square miles.

SECTION 7.—STATE OF THE BOUNDARIES.

23. *External boundaries.*—The boundaries of reserves bordering the Indian States of Travancore and Cochin are well-marked natural features or cleared lines 18 feet wide. The lines are cleared by the Forest department once in three years, the cost being shared by the concerned States. These common boundaries are being checked once in three years where they are cleared lines and not natural features, as required in G.O. Ms. No. 1795, Revenue, dated 7th August 1928.

The external boundaries of reserves are cleared lines with numbered stone cairns at sufficiently close intervals. Their maintenance is generally satisfactory. Rectification and reconstruction of cairns, where necessary, are now being carried out in Pollachi and Udamalpet Ranges.

24. *Internal boundaries.*—The internal boundaries between reserves and enclosures (including the areas disreserved for the Anamalai Estates) have survey stones planted along them; they are not kept permanently cleared.

SECTION 8.—LEGAL POSITION.

25. *State property.*—Of the reserves dealt with in the plan, all but the Tekkadi leased forest belong to Government and have been settled under section 16 of the Madras Forest Act.

26. *Leased area.*—The Tekkadi leased forest of 17,414 acres was leased from the Nambidi of Kollengode in 1851 for a period of six years. The lease was renewed in 1857 for a period of 99 years, and was revised in 1887. The most important clause of this lease bound the lessor to " the perpetual renewal and extension of the same for like periods," the rental for the first 80 years being Rs. 5,000 per annum, an equal amount for the first extension, Rs. 7,500 for the second extension and Rs. 10,000 for the third and all subsequent extensions. The leased forest was notified as a reserved forest in G.O. No. 936, Revenue (Special), dated 26th December 1918.

There has been no alteration in the terms of the lease since 1887, but an agreement for capturing elephants within the leased forest was entered into in 1921 and revised in 1929, as described in Chapter V. Also the Raja of Kollengode has contributed Rs. 6,000 towards the cost of construction of the Ayyaswamimudi ghat road and has agreed to pay against annual repairs one-sixth of the actual repair costs limited to a maximum of Rs. 400. The Raja will have, in return, the right to use the road for extraction of timber and other produce from his forests.

SECTION 9.—RIGHTS AND CONCESSIONS.

27. *Rights admitted.*—The rights admitted at settlement are mainly rights of way, rights to cut channels and take water from streams, and right of access to temples. A list of these rights is given in Appendix A; they include the rights and concessions agreed upon in the lease deed of 2nd May 1887 and later agreements between the Nambidis of Kollengode and the Madras Government.

28. *Licences.*—The District Forest Officer issues annual licences for the right to run tea shops or provision stores in specified localities and for the use of cart-tracks or threshing floors, inside reserves.

CHAPTER II.—THE FOREST.

SECTION 1.—COMPOSITION AND CONDITION OF THE CROP.

29. *General.*—The tract dealt with stretches over territory rising from an elevation of 1,200 feet to over 8,000 feet above sea-level, with an annual rainfall varying from 20 inches to about 300 inches. These variations, combined with differences of soil and aspect, have resulted in a considerable variety of vegetational types, not to mention plantations formed by human agency.

30. *Vegetational types.*—The vegetation falls into five main types :—

(i) Tropical evergreen forest (shola).
(ii) Deciduous timber forest.
(iii) Deciduous fuel forest.
(iv) Grassland.
(v) Teak plantations.

Statement showing extent of vegetational types in Coimbatore South Division.

Range.	Evergreen or shola forest.	Deciduous timber forest.	Fuel forest.	Grass or rock.	Teak plantations.	Total.
	ACS.	ACS.	ACS.	ACS.	ACS.	ACS.
Tunacadavu (New)	2,590	24,918	Nil.	4,525	3,000	35,033
Punachi (New)	36,723	7,675	2,426	21,047	40	67,911
Pollachi	646	1,363	22,714	3,859	Nil.	28,582
Udumalpet	9,178	Nil.	58,253	55,875	Nil.	1,23,306
					Grand total ..	2,54,832

(i) *Tropical evergreen forest or the shola.*

31. *General.*—The sholas occupy, roughly, the middle south of the division and cover the major portion of Punachi Range, jutting eastwards into Udumalpet Range at high elevations. In the Tunacadavu Range they occur in a few compact isolated patches in the Palakadavu, Ulandi and Mount Stuart blocks, the most accessible of which is Karian-shola (2,060 acres), touching Topslip camp. The sholas once occupied an area of about 150 square miles of the Punachi Range in a continuous stretch between 1,500 feet and 5,000 feet above sea-level, but about half of this has been disreserved mainly for the planting of tea. The Kalar valley sholas, forming a large block of about 1,500 acres, have been set apart for the planting of *cinchona* by the Government.

32. *Shola types.*—Three main types may be distinguished among the sholas dealt with—

(*a*) The comparatively dry sholas of Tunacadavu and Ulandi blocks, in which *Hopea parviflora* and *Mesua ferrea* occur in appreciable quantities (which may therefore be said to belong to the *Hopea-Mesua* association).

(*b*) The intermediate type along the upper half of Kalar valley, in which preponderate *Mesua ferrea* and *Palaquium ellipticum* (the *Palaquium-Mesua* association); and

(*c*) The wet sholas of the lower Kalar valley which support an almost pure crop of *Pœciloneuron indicum*, with a small admixture of *Cullenia excelsa* (the *Pœciloneuron-Cullenia* association).

This association appears to be due entirely to edaphic factors; it is found in all places where the soil has a high moisture content for the greater part of the year.

33. *Inhabiting species.*—The characteristic differences among the three main types of sholas within the division have been given above. Generally speaking, the chief species occurring in the top storey of the sholas are *Mesua ferrea, Pœciloneuron indicum, Palaquium ellipticum, Hopea parviflora, Cullenia excelsa, Calophyllum elatum, Vateria indica, Heritiera papilio, Aglaia roxburghiana, Dysoxylum malabaricum, Eugenia* sp., *Cedrela toona, Artocarpus integrifolia, Bombax malabaricum, Canarium strictum, Polyalthea* sp., *Amoora canarana* and many species of *Elæocarpus*. In the second storey, *Adenochlœna indica, Acronychia laurifolia, Cyclostemon macrophyllus, Gomphandra polymorpha, Lansium anamalayanum, Macaranga* sp.; *Nephelium longana* and many species of *Litsæa* and *Myristica*, are among the more prominent. The understorey is composed of *Laportea crenulata* (the devils' nettle) *Psychotria* sp., *Eugenia* sp., *Calamus* sp., cardamoms and reeds (in moist places) and several species of *Strobilanthes*.

The percentage distribution of species in the Kalar valley shola, as worked out from a 33 per cent enumeration of important species over 3 feet in girth by Mr. A. N. Sarma, is given below :—

	PER CENT.		PER CENT.
Mesua ferrea	53	*Calophyllum tomentosum*	2
Pœciloneuron indicum	22	*Cedrela toona*	1
Palaquium ellipticum	15		
Heritiera papilio	4	Total ..	100
Artocarpus integrifolia	3		

34. *Natural regeneration.*—In the *Hopea-Mesua* association, natural regeneration of *Hopea* is dense and *Mesua ferrea* also regenerates freely. Such natural regeneration remains in a suppressed condition for a long period but responds quickly if sufficient light reaches it through the top canopy.

In the *Palaquim-Mesua* association, natural regeneration of *Palaquium* is more prolific than that of *Mesua*, partly because the former seeds almost every year while the latter does not and the seeds of the former are less palatable to rodents than those of the latter. Also, since *Palaquium ellipticum* is a better shade bearer than *Mesua ferrea*, there is a marked tendency for the former to oust the latter, the advance growth of *Palaquium* being clearly noticeable while that of *Mesua* has to be sought for.

In the *Pœciloneuron-Cullenia* association, there is always a dense mass of the natural regeneration of *Pœciloneuron indicum*, and all size classes are found represented; in fact there is a marked tendency towards the crop ultimately becoming almost pure *Pœciloneuron*. Enumeration of seedlings, advance growth and poles of important species in the Kalar valley sholas, conducted by Mr. A. N. Sarma over two 16-acre plots, indicated a high rate of mortality for the younger age classes :—

Plot number.	Species.	Number of seedlings up to 12" B.H.G.	Poles of breast height girth.				Total.
			12"—18".	18"—24".	24"—30".	30"—36".	
1	*Mesua ferrea*	1,130	124	110	62	71	367
	Pœciloneuron indicum ..	270	4	4	2	4	14
	Cedrela toona	..	1	..	..	..	1
2	*Mesua ferrea*	570	73	62	38	52	225
	Pœciloneuron indicum ..	296	9	8	6	..	23
	Cedrela toona	..	1	1	2	2	6

35. *Undergrowth.*—Except for patches of *Strobilanthes* sp., the sholas are free from dense undergrowth. Canes, screwpine, cardamoms and *curcuma* occur here and there.

(ii) *Deciduous timber forest.*

36. *General.*—The deciduous timber forests in the division have been worked heavily in the past, mainly for teak and rosewood, with the result that the proportion of these valuable species to inferior ones stands considerably reduced now.

37. *Chief species.*—The chief species met with are *Tectona grandis* (teak), *Dalbergia sissoides* (rosewood), *Terminalia tomentosa* (Karumarudu), *Terminalia paniculata* (Pillamarudu) *Lagerstrœmia lanceolata* (venteak), *Pterocarpus marsupium* (vengai), *Grewia tiliæfolia* (thadasu or chadachi), *Adina cordifolia* (manjakadambai), *Stephegyne parvifolia* (nirkadambai), *Xylia xylocarpa* (irul), *Albizzia odaratissima* (karuvagai), *Schleichera trijuga* (poovam), *Stereospermum xylocarpum* (vedankoranai), *Stereopermum chelenoides* (pathiri), *Anogeissus latifolia* (vellanavai), *Acacia leucophlœa* (velvelan) and *Dillenia pentagyna* (vazhapunna). *Bambusa arundinacea*, the thorny bamboo, is abundant.

38. *Sub-types.*—Five fairly distinct sub-types may be distinguished in the main deciduous timber forests, viz. :—

(1) the sub-type on deep good soil, characterised by good height growth, a high proportion of bamboos and a limited number of species, chiefly teak, rosewood, *Lagerstrœmia lanceolata* and *Terminalia paniculata*,

(2) the sub-type on comparatively shallow soil, characterized by poor height growth, a low proportion of bamboo, a great variety of species, and presence of cycads, grass and dense lantana,

(3) the *Xylia* sub-type, found typically on lateritic soil, and in its extreme form consisting of almost pure *Xylia*, when it is unsuitable for teak,

(4) the rocky sub-type, with an open canopy and tall coarse grass and occasional small trees of *Givotia rottleriformis*, *Sterculia villosa*, *Bombax insigne* and *Cochlospermum gossypium*, and

(5) the swamp sub-type, of open grassy areas with a sparse crop of *Butea frondosa*, *Randia uliginosa*, *Zizyphus xylopyrus* and stunted *Terminalia tomentosa*.

(iii) *Deciduous fuel forests.*

39. *General.*—The deciduous fuel forests generally support *Anogeissus latifolia*, *Hardwickia binata*, *Albizzia amara*, *Melia indica*, *Acacia leucophlœa*, *Acacia ferruginea*, *Zizyphus* sp., *Tamarindus indica*, *Proteum caudatum*, *Cochlopermum gossypium*, *Sterculia urens*, *Givotia rottleriformis*, *Gyrocarpus jaquinii*, *Moringa pterygosperma*, *Chloroxylon swietenia* and, occasionally, stunted teak. *Bambusa arundinacea* and *Dendrocalamus strictus* both occur in the neighbourhood of streams.

(iv) *Grassland.*

40. *General.*—The tops of the higher hills are covered only by grass and ferns, but patches of tree growth occur along water courses and extend downwards to dense sholas on the lower slpoes and valleys. This grass-land formation is probably the combined result of shallow soil, exposure to high winds and annual fires.

(v) *Teak plantations.*

41. *General.*—The bulk of the teak plantations are in Tunacadavu Range, where they have been formed in selected areas of good quality. " Apart from a few older experimental areas, namely, the Waterfall plantation of 1872–73, of which about 5 acres survive,

and the narrow strip of plantation on the north-west side of the tramline, which is supposed to be the remnant of the old Karianshola plantation of 1874, all the plantations are of recent formation. Teak planting as a regular measure was started under Mr. Wood's Working Plan in 1919 as a result of the success of Mr. Wood's original experimental plantation of 5 acres made in 1916 at Mount Stuart. Regular planting was started on a small scale, only 28 acres being attempted in 1919, working up to a maximum of 261 acres in 1926." [M. V. Laurie.]

These plantations extended over some 1,857 acres in the year 1931, after which an extent of about 87 acres was fixed as the annual regeneration area for the Mount Stuart felling series, under Mr. Laurie's Working Plan. In the Ulandi series, Mr. Laurie's Working Plan prescribed an area of not less than 50 acres to be planted every year.

In the Punachi Working Circle, experimental sowings of teak were made by Mr. Wood in 1916–18 over plots two chains square, after which, between 1920 and 1925, about 38 acres of teak plantations were raised successfully. Mr. Sarma's Working Plan subsequently prescribed that an extent of about 25 acres should be planted with teak annually from the year 1936.

42. *Area of teak plantations in the division.*—The total extent of teak plantations in the division at the end of 1940 is 3,341 acres, of which 3,177 acres are in Tunacadavu range and 164 acres in Punachi range.

43. *Species planted.*—In the Tunacadavu range, previous to 1926 teak was planted pure, except that in 1920 the failures were replaced with *Dalbergia latifolia*, *Terminalia tomentosa* and *Terminalia paniculata*, and from 1922 onwards a few small swampy areas were planted with *Terminalia tomentosa.* In 1926, 1927 and 1928, alternate strips of teak and rosewood (*Dalbergia latifolia*) were planted as an experimental measure, the strips varying from one row to 30 rows of each.

Owing to heavy casualties in the rosewood strips, and the slow growth of the species, a dense mass of weeds and creepers invaded the area, necessitating expensive cleaning. The strip sowings were therefore discontinued and pure teak was reverted to in 1929, with the exception of an area of 30 acres in which teak and rosewood were sown at each stake. In 1930, the whole regeneration area was dibbled with teak and rosewood at every stake. From 1931 to 1939, in accordance with Mr. Laurie's Working Plan rosewood and *Pterocarpus marsupium* were dibbled at the same stake as the teak. Pure teak has been reverted to from 1939.

In the Punachi Working Circle, the earlier plantations were of pure teak, but Mr. Sarma's working plan prescribed a mixture of *Dalbergia latifolia* and *Pterocarpus marsupium*, and these species were introduced at the same stake as the teak, or in quincunx in alternate rows, from 1936. In addition to this artificial introduction of valuable species it is worthy of note that sandalwood from a neighbouring area has invaded some of the Punachi plantations to an appreciable extent.

44. *Espacement and stocking.*—The planting espacement adopted in the Mount Stuart plantations was 4½ feet by 4½ feet exclusively, up to the year 1931. In 1932, part of the regeneration area was dibbled at 4½ feet by 4½ feet and the rest stump-planted at 6 feet by 6 feet. Subsequent to 1932 the espacement has been 6 feet by 6 feet in all regeneration areas throughout the division, stump-planting having completely replaced dibbling of seeds.

Stocking varies from good to very poor; portions of Mount Stuart plantations of 1922 and 1926 and Punachi 1925 are sad examples of planting in unsuitable areas and want of proper tending.

45. *Species appearing naturally in the plantations.*—The principal subsidiary species appearing naturally in the teak plantations of the division are *Dalbergia latifolia*, *Lagerstrœmia lanceolata*, *Grewia tiliæfolia*, *Terminalia tomentosa* and *Terminalia paniculata*, *Xylia xylocarpa* and the bamboo, *Bambusa arundinacea*. Of these species, *Lagerstrœmia lanecolata*, *Grewia tiliæfolia* and *Terminalia tomentosa* tend to become "woolves" and suppress surrounding teak, while the bamboo, if left to itself, almost wipes out the teak which it surrounds.

46. *Undergrowth.*—In the best stocked areas the scanty undergrowth consists of low weeds and short grass. When the canopy is open, dense masses of *Lantana*, *Acacia pennata* and other creepers are found, while in open areas tending to swampiness, tall coarse grass is common.

SECTION 2.—INJURIES TO WHICH THE CROP IS LIABLE.

47. *Fire.*—Fires cause considerable injury to the forest crop and are largely responsible for the unsatisfactory state of natural regeneration in the deciduous forests. Normally, fires creep along the ground burning fallen leaves and grass and causing little

permanent injury to old trees but they completely destroy young regeneration or burn it down to ground level year after year. This accounts for the noticeably marked deficiency of saplings and poles of valuable species, like teak and rosewood, in these forests. The bamboos seeded and died over the whole of the Tunacadavu Range (and the old Ulandi Range) between the years 1926 and 1930. There were fierce and extensive fires among the dead bamboo in 1935 which, in spite of the elaborate measures undertaken to protect the forests from fire, not only exterminated all existing natural regeneration but destroyed many large timber trees of species like *Lagerstrœmia lanceolata*, *Dalbergia latifolia*, *Terminalia paniculata* and *Grewia tiliæfolia*. Bamboo areas overrun by fire now present the appearance of a sea of *lantana*, *Cæsalpinia* and other weeds, over which a few trees stand scattered about. Teak plantations with a reasonably close canopy do not suffer much damage from ground fires, but slash resulting from cleanings and thinnings is inflammable material likely to cause very considerable destruction in the event of fire.

Fires do not generally pass through sholas, but where the latter adjoin grassland, the margins of sholas are considerably scorched almost every year by grassland fires and the trees are sometimes killed. Protection from fires has resulted in the invasion of deciduous areas by a semi-deciduous or evergreen type in parts of Punachi Range.

48. *Origin and causes of fire.*—Some fires come in from outside crossing the Cochin or Travancore boundaries but many start within the reserves. All the fires are caused by human agency, by jungle tribes for hunting game or collecting minor produce, by graziers for promoting a flush of young grass with April showers, by the negligence of wayfarers, or by forest subordinates when fire-tracing or burning regeneration areas without sufficient care.

49. *Statement of fires.*—The statement given below gives the extent of damage done by fires within the division between 1930 and 1939 :—

Statement of fires in Coimbatore South Forest Division between 1930 *and* 1939.

Year.	Range.	Number of fires.	Area burnt in acres.	Cost of fire protection.
(1)	(2)	(3)	(4)	(5)
				RS.
1930	Udumalpet	12	648	..
	Pollachi	12	352	..
	Punachi	8	169	316
	Tunacadavu including Ulandi	1	180	1,502
1931	Udumalpet	14	1,644	..
	Pollachi	21	285	..
	Punachi	2	25	339
	Tunacadavu including Ulandi	10	2,245	1,693
1932	Udumalpet	7	209	..
	Pollachi	22	371	..
	Punachi	4	37	334
	Tunacadavu including Ulandi	7	970	1,567
1933	Udumalpet	18	1,106	..
	Pollachi	48	1,315	..
	Punachi	1	3	313
	Tunacadavu including Ulandi	10	1,170	1,616
1934	Udumalpet	14	998	..
	Pollachi	25	839	..
	Punachi	3	85	323
	Tunacadavu including Ulandi	4	800	1,296
1935	Udumalpet	10	150	..
	Pollachi	26	3,145	..
	Punachi	3	125	299
	Tunacadavu including Ulandi	9	1,246	1,604
1936	Udumalpet	8	134	..
	Pollachi	3	86	..
	Punachi	2	55	355
	Tunacadavu including Ulandi	3	202	886
1937	Udumalpet	15	3,175	..
	Pollachi	35	518	..
	Punachi	3	125	281
	Tunacadavu including Ulandi	5	220	751
1938	Udumalpet	15	525	..
	Pollachi	10	76	..
	Punachi	1	4	281
	Tunacadavu including Ulandi	9	575	685
1939	Udumalpet	7	395	..
	Pollachi	13	1,365	..
	Punachi	4	1,158	264
	Tunacadavu including Ulandi	18	10,839	1,256

50. *Man*.—In addition to the injury caused through fires, man is responsible for the degradation of the forests through the illicit removal of timber, fuel, bamboos and other forest produce. Illicit removal of forest produce is rare in Tunacadavu Range (also in the old Ulandi Range) but reaches considerable dimensions in the Pollachi and Udumalpet Ranges. The statement given below furnishes the nature and extent of forest offences detected in the division between 1930–31 and 1939–40 :—

Statement of forest offences in Coimbatore South Forest Division between 1930–31 and 1939–40.

Year.	Range.	Illicit cutting or removal.	Illicit grazing.	Miscellaneous.	Total.	Compounding fees collected.
(1)	(2)	(3)	(4)	(5)	(6)	(7)
						RS.
1930–31	Udumalpet	12	..	10	22	824
	Pollachi	94	5	2	101	922
	Punachi	3	1	..	4	39
	Tunacadavu	1	5		6	54
	All ranges	**110**	**11**	**12**	**133**	**1,839**
1931–32	Udumalpet	47	36	30	113	922
	Pollachi	76	9	26	111	759
	Punachi	..	..	1	1	2
	Tunacadavu	2	5	3	10	48
	All ranges ..	**125**	**50**	**60**	**235**	**1,731**
1932–33	Udumalpet	83	23	16	122	1,109
	Pollachi	105	8	2	115	678
	Punachi	..	..	..	..	..
	Tunacadavu	1	..	..	1	3
	All ranges ..	**189**	**31**	**18**	**238**	**1,790**
1933–34	Udumalpet	76	21	45	112	832
	Pollachi	108	7	6	121	720
	Punachi	10	6	4	20	77
	Tunacadavu	1	1	..	2	14
	All ranges ..	**195**	**35**	**25**	**255**	**1,643**
1934–35	Udumalpet	98	18	18	134	930
	Pollachi	89	6	4	99	1,111
	Punachi	5	2	4	11	105
	Tunacadavu	2	4		6	33
	All ranges ..	**194**	**30**	**26**	**250**	**2,179**
1935–36	Udumalpet	125	56	5	186	959
	Pollachi	73	14	18	105	798
	Punachi	2	..	..	2	44
	Tunacadavu	..	..	..	..	..
	All ranges ..	**200**	**70**	**23**	**293**	**1,801**
1936–37	Udumalpet	87	25	7	119	49[illegible]
	Pollachi	54	20	19	93	[illegible]
	Punachi	3	..		3	25
	Tunacadavu	1	2	1	4	44
	All ranges ..	**145**	**47**	**27**	**219**	**1,413**
1937–38	Udumalpet	62	24	6	92	826
	Pollachi	79	13	7	99	809
	Punachi	..	1	..	1	27
	Tunacadavu	1	..	..	1	6
	All ranges ..	**142**	**38**	**13**	**193**	**1,668**
1938–39	Udumalpet	104	23	13	140	435
	Pollachi	118	4	8	130	569
	Punachi	9	2	1	12	21
	Tunacadavu	1	5	5	11	10
	All ranges ..	**232**	**34**	**27**	**293**	**1,035**
1939–40	Udumalpet	127	9	10	146	649
	Pollachi	97	10	..	107	389
	Punachi	17	8	2	27	68
	Tunacadavu	1	2	..	3	12
	All ranges ..	**242**	**29**	**12**	**283**	**1,118**

51. *Animals.*—Wild elephants often break down young plantation teak in large numbers, sometimes causing considerable devastation in areas which they habitually haunt, as where there is a good growth of bamboos, or where their favourite swamp or salt lick is in the neighbourhood. Bison, sambhur and spotted deer browse down young *Hopea parviflora, Dalbergia latifolia, Pterocarpus marsupium* and *Albizzia lebbeck* and strip the bark off young *Acrocarpus fraxinifolius.* Porcupine, bats, squirrels, monkeys and rats consume large quantities of the seeds and fruits of shola trees such as *Mesua ferrea, Elaeocarpus munroii* and *Dysoxylum malabaricum.*

52. *Insects.*—The caterpillars of *Hybloea puera* and *Hapalia machoeralis* do considerable damage by defoliating teak trees though not on an epidemic scale as yet. Their presence should however be recognized as a potential danger and steps should be taken to prevent or mitigate an epidemic. The stem borer, *Phassus malabaricus*, is also present. The seeds of *Terminalia paniculata* show a high percentage of infertility, due to the attacks of a borer, probably " *Nanophyes terminalia*, Marshall."

53. *Lantana.*—In deciduous forests, lantana is a menace where the rainfall exceeds 40 inches a year and the elevation is below 3,000 feet, particularly between 2,000 feet and 3,000 feet. It rapidly invades places where the canopy is open and forms an impenetrable mass in two or three years. Where the canopy is dense it does not flourish but a few lanky plants may subsist here and there from which a rapid and vigorous spread is initiated with the opening of the canopy. Lantana suppresses seedling regeneration of many tree species, but sandalwood is able to struggle through it at Punachi. It increases the cost of clearing and causes much inconvenience in getting about the forest, but provides useful covering and humus to exposed soil.

54. *Caesalpinia mimosoides.*—This is a thorny pest typically found in recent burns: it suppresses young regeneration.

55. *Bamboo.*—In a mixed deciduous forest the bamboo occupies ground on which more valuable trees might grow. It seeds and dies periodically (once in about 30 years) and then falls down, rendering the forest highly inflammable. The fierce fires which almost invariably follow cause serious damage or death to large timber trees even and wipe out all existing regeneration, as was the case in the fires of 1935 in the Tunacadavu range, after the gregarious flowering of 1926–30. For several successive years the canopy is left open to the invasion of lantana and other weeds. The resulting bamboo regeneration is often impenetrably dense, suppressing seedlings of tree species and forming a pest costly of eradication from areas to be planted up with timber species. It is noticeable however that timber grown in the midst of bamboos is clean, straight and of uniform rate of growth, and that the bamboo ensures a good burn in a clearfelled area.

56. *Climbers.*—The climbers *Spatholobus roxburghii, Acacia pennata* and *Zizyphus œnoplia* do most damage in the deciduous forest and plantations. In the evergreen and semi-evergreen types, *Entada scandens, Gnetum scandens, Bauhinia* sp., *Calamus* sp., and *Acacia concinna* are the common climbers.

57. *Grass.*—The coarse " elephant grass " (*Imperata arundinacea*) is inimical to tree growth and indicates areas unsuitable for teak planting. Grass areas, in general, are subject to frequent fires and are in consequence unfavourable to the natural establishment of tree growth thereon.

58. *Strobilanthes.—Strobilanthes*, of various species, covers the ground densely in parts of the evergreen forests. It hinders the development of natural seedlings of some tree species but rarely smothers them.

59. *Fungi.*—The fungus *Uncinula tectoni* sometimes attacks the leaves of teak in young plantations, but not to a serious extent.

60. *Wind.*—Considerable damage to teak plantations is caused by winds which break off weak or damaged stems of teak. Early and heavy thinnings are indicated with a view to develop girth increment at an early age and consequent resistance to winds.

CHAPTER III.—UTILIZATION OF THE PRODUCE.

SECTION 1.—AGRICULTURAL CUSTOMS AND WANTS OF THE POPULATION.

61. *Census of taluks concerned.*—The census of 1931 gives the population of Pollachi and Udumalpet taluks as follows :—

Taluk.	Area, square miles.	Males.	Females.	Total.	Population per square mile.
Pollachi	692	1,46,304	1,43,129	2,89,433	418
Udumalpet	566	83,634	86,798	1,70,432	301

The " Anamalais hills village " was constituted in 1932 out of the tea and other plantations on the hills of the Pollachi taluk.

62. *Proportion of reserved forest.*—About 23 per cent of Pollachi and 35 per cent of Udumalpet taluk consists of reserved forests, private forests being negligible.

63. *Agricultural customs.*—Agriculture is the main industry of the neighbouring population. In areas served by canals, paddy and sugarcane are the main crops, and two crops of paddy are usually raised in the year. Where underground water can be easily tapped by wells, tobacco and cotton are raised with good profit. Electrification of rural tracts is extending this practice considerably.

In the Pollachi taluk, the land in the neighbourhood of reserves is particularly rich and the climatic conditions are favourable for the production of two dry crops in the year : the total rainfall is not high but both the monsoons are felt. Cholam, ragi, groundnut and cotton are the crops commonly raised.

In the Udumalpet taluk dry crops can usually be raised only once in the year.

64. *Shifting cultivation.*—Muduvars, Pulayars, Kaders and other hill tribes are permitted to practice shifting cultivation inside areas set apart for the purpose within the reserves partly because they provide necessary labour for the Forest department. Ragi is the crop usually raised and the seeds are sown in April–May after the burning of the slash. The grain is harvested in September or October. This practice has been made use of by the department in raising teak (primarily) successfully by the method of " ponam regeneration " at Punachi, Palakadavu and Mount Stuart. It is obvious that the method can also be applied to the regeneration of species like sandalwood, *Sapindus laurifolius* and *Terminalia chebula.*

65. *Wants of the population.*—Timber, bamboos, firewood, charcoal, agricultural implements, various kinds of minor produce and grazing are the main requirements of the neighbouring population. There is also a small demand for manure leaves. The timber market at Pollachi, in addition to meeting its own increasing needs. is the main centre of supply for the rapidly growing industrial town of Coimbatore, and of Udumalpet, Dindigul, Trichinopoly and Madura.

(*a*) *Timber.*—The chief species usually in demand are, in the order of importance, *Tectona grandis, Dalbergia latifolia, Pterocarpus marsupium, Terminalia paniculata, Xylia xylocarpa, Lagerstroemia lanceolata, Grewia tiliaefolia, Hopea parviflora* and *Mesua ferrea* (for railway sleepers only). There appears to be a good demand for teak poles as large quantities are still being imported into Coimbatore district from Malabar, in spite of the supply from thinnings among the Mount Stuart plantations.

(*b*) *Bamboos.*—*Bambusa arundinacea* and *Dendrocalamus strictus* are both in keen demand in the villages. Bamboo coupes generally fetch reasonable prices.

(*c*) *Firewood and charcoal.*—Firewood is in great demand for domestic purposes and charcoal for metal craftsman. The cotton and groundnut mills in the Coimbatore district are steadily being electrified so that the industrial demand for this purpose is decreasing. Except in Udumalpet range, fuel coupes fetch reasonable prices. In the Udumalpet range, recent disreservation of large areas, a succession of poor rains and bad extraction roads have contributed towards slackness of demand for some time.

(*d*) *Minor produce.*—The bark of *Cassia auriculata*, fruits of *Terminalia chebula*, honey, wax, cardamoms, shekoy (*Acacia concinna* pods), soapnuts (*Saphindus laurifolius*), tamarind, roots of *Gymnema montana*, canes, white and black dammar, are the chief minor produce in demand.

(*e*) *Manure leaf.*—There is some demand for green leaf manure for the paddy lands near Kottur and Kombu. The demand from Kottur is not keen : the lands are somewhat distant from the reserve, and the ryots generally use *Calotropis gigantea* and *Tephrosia* from dry lands or porambokes or grow horsegram in their fields which they plough in. The demand near Kombu is for the lands jutting inwards into the Amaravathi reserve from Kombu towards Manthorai and at least part of the requirement is being systematically smuggled into them from the adjoining reserve.

(*f*) *Agricultural implements.*—The demand for agricultural implements in the Pollachi taluk is generally met from fuel coupes or from the timber depots of Pollachi. It cannot be denied, however, that some implements are stolen from the reserves. The demand from many villages of Udumalpet taluk cannot be met from the fuel coupes of the Udumalpet range however, owing to the general poverty and slowness of growth in them. Therefore, in order to meet this demand legitimately, removals of agricultural implements on head-load permits have been permitted for the last ten years from annual coupes, near Pundi, varying from 5 to 50 acres, within the area set apart for shifting cultivation by Pulayars. The annual removals have averaged about 600 head-loads, though when the area of the coupe was too small (as in 1939–40, when it was 5 acres only) the removal was limited to what the area was capable of yielding. Similar coupes were demanded by the ryots of Dhali, Jellipatti, Manupatti and Elayamuthur. Though coupes

for the removal of agricultural implements have been tried elsewhere in the Presidency, the response has been meagre, while the coupes at Pundi have been an unqualified success.

(*g*) *Grazing.*—Of the total area of the two concerned taluks, Pollachi and Udumalpet, only 28·5 per cent is reserved forest and of the total number of cattle in them, about 7 per cent alone seek grazing and penning in the reserves. The average annual number of cow units which usually graze in Pollachi range is 6,750 while in Udumalpet range it is 9,500. Tunacadavu (including Ulandi) range is closed to grazing and only some 200 cattle graze in the Punachi range.

(*h*) *Penning.*—Penning inside the reserves is permitted. About 2,500 cow units pen in Pollachi range every year and some 5,000 units in Udumalpet range.

66. *Incidence of grazing.*—The incidence of grazing for penning cattle in Pollachi range is about 6 acres per cow unit, and in Udumalpet range about 15 acres per cow unit. For non-penning cattle, it is about one acre per cow unit in Pollachi range and twice as much in Udumalpet: this is due to closure of fuel coupes to grazing for a period of ten years after felling.

SECTION 2.—MARKETS AND MARKETABLE PRODUCTS.

Markets.

67. *Pollachi.*—Pollachi is the central market for all products and the weekly shandy on Thursday is a great event attended by buyers and sellers in thousands. Agricultural produce from within a radius of 50 miles is sold at this shandy and the number of laden carts leaving Pollachi every Thursday and Friday has been estimated at 3,500. Pollachi is thus a popular depot for all forest produce including timber. It also forms a central distributing station on the South Indian Railway system (metre gauge).

The capacity of this market was about a lakh of cubic feet per annum, without a drop in prices. With the advent of the Palghat-Pollachi-Dindigul railway and the rapid expansion of house-building activities in the growing industrial town of Coimbatore, there has been an appreciable improvement in demand for Pollachi timber. The size of the timber does not affect the prices appreciably, however. The Forest department maintains a timber sale depot at Pollachi.

68. *Udumalpet.*—Next in importance to Pollachi is the Monday shandy at Udumalpet, but the stocks held here by private dealers is small compared with Pollachi.

69. *Chalakudi.*—Chalakudi, in the Cochin State, is the most accessible market for the timber from the Ulandi and Palakadavu blocks, where it is subject to competition from timber from the forests of the Cochin State.

Marketable products.

70. *Timber.—Teak, Dalbergia latifolia, Pterocadpus marsupium, Terminalia paniculata, Xylia xylocarpa* and *Lagerstroemia lanceolata* are the chief marketable deciduous species in the order of demand. Other species can be sold in small quantities. *Mesua ferrea* can only be sold to the railways in the shape of sleepers. Sawn scantlings (Kolmarams) of *Cedrela toona, Palaquium ellipticum, Calophyllum elatum* and *Acrocarpus fraxinifolius* can sometimes be sold at a profit.

71. *Teak poles.*—There are good markets at Pollachi and Ondiputhur (near Singanallur) for teak poles resulting from thinnings: poles are being supplied from private plantations in Malabar. Teak poles will find ready sale if the bark is intact and is not discoloured: poles should therefore be put up for sale soon after felling.

72. *Spokes and felloes.*—Dealers from Palghat buy large quantities of spokes and felloes from Mount Stuart.

73. *Other produce.*—Bamboos, fuel and minor forest produce are usually marketed by contractors. Permits for the removal of agricultural implements, reeds, stone and brakepoles are sold departmentally.

SECTION 3.—LINES OF EXPORT.

74. *Railways.*—The South Indian Railway, metre gauge, connects Pollachi and Udumalpet with Palghat and Coimbatore and with the eastern and southern districts.

75. *Main transport roads.*—All produce from the locality find their way by road to Pollachi or Udumalpet, both on the South Indian Railway. The undermentioned roads are important :—

(1) The Chinnar-Udumalpet road is the main transport road in the Udumalpet range. It is a good metalled road maintained by the Public Works Department, and its length is 18 miles from Chinnar (Travancore frontier) to Udumalpet.

(2) The Valparai-Pollachi road is 39 miles long and is maintained by the Public Works Department. It serves the Punachi and Pollachi ranges. Tea planters have extensions of the road into their estates.

(3) The Sethumadai-Pollachi road is 15 miles long and is maintained by the district board. It serves the Tunacadavu and Pollachi ranges.

76. *Chief forest roads.*—The chief forest roads are :—

(1) Sethumadai-Topslip ghaut road, about 7 miles long.
(2) Extension of (1) to Anipadi and on to Sungam, about 9½ miles.
(3) Sethumadai-Ayyaswamimudi ghaut road, 4¾ miles (Dawson road).
(4) Extension of (3) to Tekkadi and towards Tellikal 6 miles and 1 furlong.
(5) Branch road from (2) into Sichalipallam, 7 miles and 2 furlongs.
(6) Aliar road, connecting Gundrau and the Valparai ghaut road through the Punachi Working Circle, 6½ miles.
(7) Cinchona lower road, from near Cinchona rest-house to Poovar, 4 miles.
(8) Elayamuthur-Manthorai cart track, about 9 miles.

77. *The Cochin Forest Tramway.*—Timber from the Ulandi and Palakadavu blocks is best extracted through the Cochin Forest Tramway, one end of which is only about a mile from Palakadavu camp and the other connects with Chalakudi on the South Indian Railway. The total length of the tramway is 51 miles. The rates of transport are however too high to permit of any timber, except teak and *Dalbergia latifolia*, being taken down at a profit.

78. *Right to use roads in tea plantations.*—The Forest department and its contractors have the right to use all roads and paths made by the planters. Should timber be transported by or on behalf of the Forest department over any such road or path, a contribution towards its maintenance shall be paid by the department, the amount of which may be decided by mutual agreement or by the Collector.

SECTION 4.—METHODS OF EXPLOITATION AND THEIR COST.

Timber.

79. *Mount Stuart timber.*—Timber from coupes in the Mount Stuart area is exploited departmentally. Enumeration, marking and numbering are completed usually by June-July previous to the year of felling. Trees are numbered at foot and at breast height. Felling commences in May and is executed by malasars and Cochin or Palghat axemen. Logging, barking, squaring, snouting and dragholes are done by the felling coolies who are paid for by the cubic foot. Logs of very large girth are sawn longitudinally to facilitate carting. Logs are chisel-numbered showing the year of felling, coupes, species, tree number, a letter indicating whether the log is the butt, second or third log, etc., of a tree, the depot number and a number indicating quality. Volumes are calculated by the "quarter girth square" method, girth being measured at the centre, under bark. Dragging to roadside depots is done by Government elephants which also help to load exceptionally large logs on to carts or lorries.

Poor quality logs are sometimes auctioned at roadside depots in the forest, but as a rule all logs are transported to Pollachi depot on pneumatic tyred carts or carts with 3 inches iron tyres or motor lorries.

Dalbergia latifolia (rosewood) is usually dressed round, removing all sapwood so as to expose the colour of the heartwood. *Lagerstroemia lanceolata* (venteak) is offered for sale with the bark on, to prevent splitting. All other timber, including teak, is usually dressed square, leaving the corners rounded and with sapwood on. Exceptionally good logs of teak are offered in the round.

80. *Current exploitation rates, Mount Stuart timber.*—The prevailing exploitation rates for Mount Stuart timber are given below :—

	RS.	A.	P.	
Felling and conversion into squared timber	0	1	2	per cubic foot.
Felling of rosewood, round dressed to heartwood	0	1	0	"
Felling of teak and *Terminalia tomentosa* into round logs, bark removed ..	0	0	7	"
Felling and logging of venteak, bark, on	0	0	3	"
Teak spokes and felloes—Single set	4	0	0	per set of 12 felloes and 24 spokes.
Do. Block set	2	8	0	"

	RS.	A.	P.	
Longitudinal sawing—				
Logs of 100 to 125 cubic feet	8	0	0	per log.
„ 125 to 150 „	9	0	0	„
„ 150 to 175 „	10	0	0	„
„ 175 to 200 „	11	0	0	„
Logs above 200 cubic feet	12	0	0	„
Carting to Pollachi depot—				
From Sichalipalam or Tellikal	0	4	6	per cubic foot.
„ Tekkadi	0	3	6	„
„ Topslip	0	3	0	„

81. *Elephant dragging.*—Dragging costs have been worked out for the last three years and are as follows taking only dragging days into account :—

	RS.	A.	P.	
1937–38	0	0	9·2	per cubic foot.
1938–39	0	0	10·3	„
1939–40	0	0	10·2	„

If total expenditure on elephants is charged entirely against timber dragged, the costs will work out as follows :—

	RS.	A.	P.
1937–38	0	2	0
1938–39	0	2	1
1939–40	0	1	7

Overheads, such as forester in charge of elephants, Assistant Veterinary Inspector and Inspector of Livestock, have not been included in these calculations.

82. *Palakadavu timber.*—In the Palakadavu and Ulandi blocks exploitation was through contract agency. The trees were marked, their breast height girths over bark were measured and the lengths of utilizable bole estimated by eye. In 1931–32 the contractor paid the department on the actual outturn of logs dragged to a passing depot, measured on the "quarter girth square" method. This system was abandoned in 1932–33, after which the contractor paid for the standing tree on their volume as calculated by the product of its estimated length of utilizable bole and the square of one quarter of its girth over bark at 4 feet 6 inches from ground level, modified by a form factor which was 0·65 during the major part of the contract period (1931–40). The contractor was bound to purchase a minimum quantity of a lakh of cubic feet every year. Teak and rosewood were paid for at 9 annas a cubic foot and miscellaneous species at an anna per cubic foot. The contractor dragged the logs, by means of elephants, to the head of the Cochin Tramway near Palakadavu and transported them to Chalakudi. He had a sawmill working at the tramhead for some time but this was subsequently removed to Chalakudi.

83. *Punachi timber.*—In the Punachi range, the clearfelling coupes have been sold standing to contractors, every year, at rates agreed upon per acre. Selection coupes were either worked departmentally and the extracted timber sold at forest depots on roadside or transported to Pollachi depot for sale, or the marked trees were sold standing to contractors as described in paragraph 82 above in the case of Palakadavu and Ulandi blocks. The form factor was 0·75 for sound trees and 0·33 for unsound ones. The extraction rates for departmental work were as follows :—

	RS.	A.	P.	
Felling and conversion of logs in the round	0	0	9	per c.ft.
Felling and conversion into squared logs or round dressing rosewood down to the heartwood	0	1	4	„
Transport to Pollachi	0	5	0	
	to			
	0	6	0	„

84. *Railway sleepers.*—Railway sleepers of Mesua ferrea are extracted from the Kalar valley forests on a system of piecework contract. Trees for felling and conversion are selected, marked and numbered by the department. The contractor fells, logs and saws the marked trees into railway sleepers, under departmental supervision, and drags and delivers them at roadside depots, at rates fixed beforehand for every sleeper passed by the Range Officer at the roadside depots. The contractor imports skilled labour from Malabar consisting of sawyers and dragging coolies. The coolies make ropes out of canes and

drag the sleepers to roadside depots. A gravity ropeway, maintained by the department, is used to shift the sleepers across the Kalar from coupes on the other side of the road. The passed sleepers are transported to Pollachi by a separate contractor, the Anamalai Transport Company in this case, who transport the sleepers from roadside to Iyerpadi by motor lorry, by wire ropeway from Iyerpadi to Vannanthorai at the foot of the hills, and thence by carts or lorries to Pollachi. The Forest Utilization Officer passes the sleepers at Pollachi on behalf of the railway.

The cost of extraction of broad gauge railway sleepers has varied as shown below : metre gauge sleepers cost about one half of these rates :—

Year.	Coupe.	Conversion and delivery at road-side.	Transport to Pollachi.	Total.
		RS. A. P.	RS. A. P.	RS. A. P.
1935–36	I	2 6 9	1 8 0	3 14 9
1936–37	II	2 7 6	1 8 0	3 15 6
1937–38	III	2 7 6	1 9 0	4 0 6
1938–39	IV	2 7 6	1 5 6	3 13 0
1939–40	V	2 10 0	1 5 0	3 15 0
1940–41	VI	2 7 0	1 3 6	3 10 6

Note.—For 1940–41 the extraction was from coupes IV and V worked before and a portion of coupe VI and in the former two coupes there were no restrictions about felling marked trees only : any *Mesua* tree which would yield sleepers could be felled.

85. *Fuel.*—In the Pollachi range, firewood is cut and stacked in the coupe at a rupee per stack of 81 cubic feet (6 feet by 4½ feet by 3 feet). Cart hire from the coupes to Pollachi is round about Rs. 4 per cart. In the Udumalpet range the felling charges are about the same, but the coolies work on daily wages and no stacks are built in the coupe : the fuel is transported to the contractor's depot at Udumalpet where the cartmen are paid at six to seven pies per maund of 25 lb. after weighing.

86. *Bamboos.—Bambusa arundinacea* is collected in the shape of odai (ஓடை) Dabbai (தப்பை) and Vettukali (வெட்டுக்கழி). Dendrocalamus is collected in the shape of Medar (மேதர்) Pachy (பாச்சி). The bamboo contractor pays for the collection of different kinds and delivery at cart head as follows :—

	In Pollachi Range.	In Udumalpet Range.
	RS.	RS. A.
Odai	8 to 10 per 100	..
Dabbai (split)	3 to 4 per 500	2 0 per 500.
„ (unsplit)	3 to 4 per 100	2 0 per 100.
Vettukali	3 per 100	6 4 per 100.
Medar	2 to 3 per 100	6 4 per 100.
Pachy	1 per 500	2 0 per 500.
Valai (வளை)	..	0 4 each.

The bamboos are usually transported to Pollachi or Udumalpet for sale.

87. *Minor produce.*—Contractors pay for the collection of different kinds of minor produce at the following rates, usually, but payment is sometimes made in the shape of grain or opium :—

	RS. A. P.
Honey	4 8 0 per tin.
Wax	0 2 8 per lb.
Shekoy	0 12 0 per maund of 25 lb.
Cardamom	0 4 0 per lb. to 0 5 0
Dammer	1 2 0 per maund of 25 lb.
Canes	3 8 0 per 100.
Soapnut and Gallnut	0 0 6 per Madras measure.
Tamarind	0 8 0 per maund of 28 lb.

SECTION 5.—PAST AND CURRENT PRICES.

Timber.

88. *At sale depots.*—The size of the logs does not appear to affect the prices very noticeably: in fact, very large sizes tend to lower prices owing to greater likelihood of unsoundness.

The average prices realized for timber at Pollachi depot between 1931–32 to 1939–40 are shown below :—

Average prices realized for timber at Pollachi depot.

Species and class.	1939–40.	1938–39.		1937–38.	1936–37.	1935–36.	1934–35.	1933–34.	1932–33.	1931–32.
	Average rate per cubic foot during.									
	RS. A. P.	RS. A. P.		RS. A. P.	RS. A. P.	RS. A. P.	RS. A. P.	RS. A. P.	RS. A. P.	RS. A. P.
Teak A.L. No. 1 ..	2 5 9	2 11 9								
„ 2 ..	1 15 9	2 7 4								
„ 3 ..	1 9 9	2 1 1								
Teak A.S. No. 1 ..	1 14 3	2 7 9								
„ 2 ..	1 9 11	2 4 1	Average for all classes.	2 7 5 Squared and 2 15 8 round.	1 13 8	2 1 4	2 5 0	1 7 8	1 14 3	2 3 7
„ 3 ..	1 6 9	1 14 0								
Teak B. No. 1	1 8 3	1 14 10								
„ 2	1 7 6	1 13 2								
„ 3	1 3 3	1 11 5								
Teak C	1 1 9	..								
Rosewood A.L. No. 1 ..	3 1 3	2 12 4								
„ 2 ..	1 3 4	1 12 6								
„ 3 ..	..	1 10 2								
Rosewood A.S. No. 1 ..	2 5 0	2 6 3								
„ 2 ..	1 2 9	1 8 1	Average for all classes.	2 7 7	2 3 0	2 14 2	2 3 2	1 4 10	2 1 3	1 15 5
Rosewood B. No. 1 ..	1 8 0	1 15 5								
„ 2 ..	..	1 10 5								
„ 3 ..	0 13 0	1 2 0								
Rosewood C.	0 15 6	..								
Pterocarpus marsupium ..	1 2 5	1 1 8		..	0 15 1	..	1 1 8	1 2 7	0 15 11	0 14 11
Terminalia paniculata ..	0 14 1	1 5 8		1 7 10	1 3 11	0 15 4	1 2 2	1 3 0	0 12 11	1 1 4
Terminalia tomentosa ..	0 11 6	0 13 1		1 2 11	0 13 10	0 15 11	0 15 8	0 5 9	0 9 5	0 12 10
Lagerstroemia lanceolata ..	0 11 10	1 3 7		1 7 0	1 0 4	0 13 10	1 3 3	1 2 0	1 1 2	0 10 11
Xylia xylocarpa	0 12 6	0 15 9		1 3 4	0 12 0	..	..	..	..	0 14 0
Grewia tiliaefolia	0 11 1	1 2 4		1 6 8	1 0 6	1 2 2	0 13 6	1 2 7	0 15 0	0 9 5
Adina cordifolia	0 15 3	1 6 2		1 7 3	0 15 5	0 12 3	..	..	..	0 6 1

89. *At forest depots.*—The average prices realized at forest depots are given below :—

Average prices realized at forest depots in Tunacadavu Range.

Species and class.	1930–31.	1931–32.	1932–33.	1933–34.	1934–35.	1935–36.	1936–37.	1937–38.	1938–39.	1939–40.
	Average rate per cubic foot during									
	RS. A. P.	RS. A. P.	RS. A. P.	RS. A. P.	RS. A. P.	RS. A. P.	RS. A. P.	RS. A. P.	RS. A. P.	RS. A. P.
Teak	0 4 6	0 6 3	0 6 5	0 10 10	0 14 4	0 14 7	0 13 1	1 5 8 (Squared) 2 0 0 (Round)	0 11 9	0 9 7
Rosewood	0 9 9	0 3 5	0 7 8	0 8 7	0 15 4	0 11 9	1 2 6	1 5 11	0 8 9	..
Pterocarpus marsupium ..	0 4 5	..	0 3 0	0 7 6	0 6 1	0 4 0	0 8 5	..	0 4 11	0 3 6
Terminalia tomentosa ..	..	0 3 11	0 3 0	0 3 8	0 9 0	0 4 10	0 5 8	0 8 3 (Squared) 0 6 0 (Round)	0 4 5	0 3 10
Terminalia paniculata ..	..	0 4 0	0 10 9	0 9 1	0 9 9	0 7 4	0 11 5	0 14 5	0 8 9	0 5 6
Lagerstroemia lanceolata ..	..	..	0 8 1	0 7 9	0 9 8	0 6 5	0 9 10	0 13 5	0 8 1	0 2 6
Xylia xylocarpa	..	..	0 6 10	..	..	0 4 8	0 12 0	0 8 9	0 3 8	0 4 0
Grewia tiliaefolia	..	..	..	0 6 1	0 13 3	0 6 4	0 9 2	0 14 6	0 7 9	0 5 6
Adina cordifolia	..	..	0 3 0	0 8 0	..	0 7 5	0 5 10	0 10 2	0 5 4	..
Stephegyne parvifolia ..	..	..	..	..	..	0 8 0	..	..	..	..
Misc. species	..	0 1 1	0 3 0	0 0 6	..	..	0 3 0	..	..	..
Teak spokes and felloes per set.	..	..	..	6 5 11	6 5 0	8 10 10	16 14 6	11 11 11	12 3 0	13 12 0
Teak blocks per set ..	..	..	..			8 12 0	9 0 0	10 8 4		

90. *Teak poles from thinnings.*—The prices realised for teak poles from thinnings are given below :—

Sale price of teak poles from thinnings.

Year.	Number of poles sold.	Amount.	Year.	Number of poles sold.	Amount.
		RS. A. P.			RS. A. P.
1933–34	675	20 4 0	1937–38	14,500	1,359 6 0
1934–35	10,852	1,030 9 6	1938–39	16,549	4,131 1 3
1935–36	7,533	531 14 3	1939–40	1,590	335 0 0
1936–37	7,295	424 11 0			

91. *Driftwood.*—The amounts realized by sale of driftwood in Udumalpet range are given below :—

Year.	Amount.
	RS. A. P.
1935–36	..
1936–37	205 0 0
1937–38	..
1938–39	..
1939–40	301 0 0
1940–41	70 0 0

92. *Agricultural implements.*—Agricultural implements were sold from Pundi Agricultural implements coupe at 1 anna head load. The sales were as follows :—

Year.	Amount. RS. A. P.
1935–36	25 15 0
1936–37	37 8 0
1937–38	43 12 0
1938–39	41 15 0
1939–40	12 2 0

93. *Ulandi valley.*—The following statement shows the average prices paid by the contractor Mr. E. J. Kuruvilla for the trees sold standing, the yield being calculated by applying a form factor.

Year.	Average rate per cubic foot.			
	Teak.	Rosewood.	Other species.	
	RS. A. P.	RS. A. P.	RS. A. P.	
1931–32	0 11 9	0 13 9	0 2 0	
1932–33	0 9 0	0 9 0	0 8 0 (*Hopea.*)	
1933–34	0 9 0	0 9 0	0 8 0 (*Hopea.*)	
	0 4 0		0 1 0 (*Km. & Pm.*)	At concessional rates due to inaccessibility.
1934 to 1940	0 9 0	0 9 0	0 8 0 (*Hopea.*) 0 1 0 (Km.)	

94. *Punachi timber.*—The following statement exhibits the prices fetched by sale of timber between 1935–36 and 1940–41 :—

Year.	Clearfelling Working Circle.		Selection Felling Working Circle.				
	C. No.	Rate per acre.	Compt.	Rate per cubic foot.			
				Teak.	Vengai.	Rosewood.	*Hopea.*
				RS. A. P.	RS. A. P.	RS. A. P.	RS. A. P.
1935–36	I	9	10	1 1 3	0 9 0	1 2 2	..
	II	18	..	..	..	..	..
1936–37	III	26	13	0 8 0	0 8 0	0 8 0	..
1937–38	IV	30	15	0 6 0	0 6 0	0 6 0	..
1938–39	V	24	16	0 8 9	Not sold.	Not sold.	0 6 6
1939–40	No sale.						
1940–41	VI	42	..	..	..	..	..

95. *Railway sleepers.*—The prices obtained for broad gauge and metre gauge sleepers have been Rs. 6 and Rs. 2–12–0 respectively, during the period from 1935–36 to 1940–41.

Firewood.

96. *Market rates.*—Firewood is extracted and sold by contractors. The market rates at Pollachi and Udumalpet vary considerably according to season and demand, but the average is about Rs. 7–8–0 per ton at Pollachi and Rs. 7 per ton at Udumalpet. Failure of rains in Udumalpet taluk during the last three or four years resulted in fuel fellings from patta lands reducing the demand on departmental fuel coupes. The demand has improved in 1940.

The subjoined statement shows the prices fetched for fuel coupes :—

Prices fetched per acre.

Fuel series.	1934–35.		1935–36.		1936–37.		1937–38.		1938–39.		1939–40.		1940–41.	
	C. No.	Amount.	C. No.	Amount.	C. No.	Amount.	C. No.	Amount.	C. No.	Amount.	C. No.	Amount.	C. No.	Amount.
		RS.		RS.		RS.		RS.		RS.		RS.		RS.
Pollachi range—														
Pothamadai	XIV	55	XV	36	XVI	27	XVII	23	XVIII	23	XIX	35	XX	23
Ayerangal	XIV	56	XV	31	XVI	22	XVII	31	XVIII	70	XIX	43	XX	35
Gudaravalli	XIV	75	XV	21	XVI	13	XVII	9	XVIII	14	XIX	7	XX	6
Kottur	XIV	14	XV	17	XVI	6	XVII	6	XVIII	10	XIX	6	XX	18
Keerapadi	III	43	IV	23	V	73	VI	61	VII	50	VIII	56	IX	77
Nallar	XVII	3	VII	3	VIII	3	IX	3	X	3	XI	10	XII	N.S.
Pachathanni	V	70	VI	72	VII	N.S.	VII	11	VIII IX	10 N.S.	X	N.S.	XI X IX	8 8 N.S.
Udumalpet range—														
Dhali	XVa	13	XII	N.S.	XIII XII	N.S. 9	XIII XIV	N.S. N.S.	XV	N.S.	XIII to XVI	N.S.	XVI } XVII }	3
Kamanuthu	XV	30	XVI	31	XVII	22	XVIII	N.S.	XIX XVIII	N.S. 8	XIX XX	N.S. N.S.	XIX XX XXI	4 4 4
Amaravathi	XV	15	XVI	N.S.	XVII	8	XVI XVIII	5 6	XIX	7	XX *	N.S.	XXI	4
Navalodai	..	..	I	18	II	N.S.	II III	N.S. N.S.	II IV	.. N.S,	II to V	N.S.	*II to VI	N.S.
Chinnar	..	..	I	13	II	13	III	16	IV	22	V	N.S.	V VI	6 6

* Area has been proposed for disreservation.
N.S. = Not sold.
Purchasers pay Rs. 2–4–0 to Rs. 4 per stack of 81 c.ft. at the coupes in Pollachi range depending on the species of fuel.
Sale price at Pollachi average Rs.10 per cart-load of one stack.
In the Udumalpet range no fuel is sold at the coupes, as a rule. The contractors maintain depots at Udumalpet at which a ton of fuel (by weight) sells at Rs. 7 to Rs. 8 unsplit, and Rs. 10 split.

Bamboos.

97. *Price of bamboo coupes.*—The prices fetched for bamboo coupes between 1934–35 and 1940–41 are given below :—

Bamboo series.	Price obtained for coupe.													
	1934–35.		1935–36.		1936–37.		1937–38.		1938–39.		1939–40.		1940–41.	
	C. No.	Price.	C. No.	Price.	C. No.	Price.	C. No.	Price.	C. No.	Price.	C. No.	Price.	C. No.	Price.
		RS.		RS.		RS.		RS.		RS.		RS.		RS.
Pollachi range—														
Pothamadai	II	226	III	355	I	510	II	N.S.	III	305	I	500	II	335
Ayerangal—														
Upper	II	N.S.	III	370	I	1,400	II	575	III	310	I	1,105	II	575
Lower	II	380	III	405	I	N.S.	II	230	III	381	I	200	II	150
Pachathanni	II	651	III	655	I	235	II	501	III	600	I	230	II	N.S.
Villoni	II	805	III	630	I	275	II	525	III	750	I	N.S.	I } II	605
Thadaganachi	II	351	III	605	I	725	II	185	III	N.S.	I	502	II	135
Punachi range—														
Punachi	..	..	III	275	I	225	II	175	III	315	I,	N.S.	I } II	215
Udumalpet range—														
Thalinji and Manjampatti ..	..	..	..	..	I	N.S.	..	..	..	..	..	..	..	..
	II	820	III	850	I	360	II	N.S.	III	720	I	250	II	710
Pundi and Vendayam	II	800	III	N.S.	I	302	II	400	III	N.S.	I	250	II	375
Isalthittumangear	..	..	..	..	..	..	II	170	III	N.S.	I	405	II	145

N.S. = Not sold.

The price fetched by sale of bamboos in Tunacadavu range between 1931–32 and 1940–41 is given below :—

Year.	Amount.	Year.	Amount.
	RS.		RS.
1931–32	..	1936–37	505
1932–33	525	1937–38	Not sold.
1933–34	405	1938–39	705
1934–35	530	1939–40	530
1935–36	900	1940–41	1,005

Bamboos are sold at Pollachi and Udumalpet as shown below :—

Kind.	Quantity.	Udumalpet.	Pollachi.
		RS. A. P.	RS. A. P.
Odai	100	..	16 0 0
Dabbai	100	3 0 0	1 8 0
Medar	100	9 0 0	4 0 0
Vettukali	100	10 0 0	10 0 0
Pachy	100	2 12 0	1 12 0
Thorns	Cart-load.	..	3 0 0
Do.	Head-load.	..	0 3 0

Minor produce.

98. *Sale price of minor forest produce.*—The prices obtained by sale of the right to collect minor forest produce from 1934–35 to 1940–41 are furnished below :—

Range.	Unit.	1934–35.	1935–36.	1936–37.	1937–38.	1938–39.	1939–40.	1940–41.
		RS.	RS.	RS.	RS.	RS.	RS.	RS.
Pollachi ..	Gallnuts	80	195	71	Not sold.	Not sold.	50	50
	All other items ..	840	725	900	1,000	1,050	940	1,005
Punachi ..	All items. Leased to Anamalai Planters' Association.	1,200	1,200	1,200	1,200	1,200	1,200	1,200
Udumalpet.	Gallnuts	1,365	1,380	1,000	1,350	1,015	650	1,270
	Cassia fistula bark.	..	..	75	..	..	..	..
	Eacham grass ..	..	..	..	..	421	50	..
	Avaram bark, Dharapuram taluk.	280	150	162	210	217	155	725
	Avaram bark, Udumalpet taluk.	Not sold.	Not sold.	57	Not sold.	60	Not sold.	25
	Other items ..	**1,252**	**1,345**	**1,300**	**1,387**	**1,432**	**650**	**1,430**

Bazaar prices.

The bazaar sale rates for the different kinds of minor produce are more or less as shown below :—

Honey	Rs. 10 per tin.
Wax	12 anna per lb.
Shekoy	Rs. 1–12–0 per maund of 25 lb.
Cardamom	Re. 1–6–0 to Rs. 2–2–0 per lb.
Dammar	Rs. 6 per maund of 25 lb.
Canes	Rs. 5 to Rs. 6 per 100.
Tamarind	Rs. 1–8–0 per maund of 25 lb.
Gallnut	Rs. 2–8–0 per maund of 25 lb.

CHAPTER IV.—STAFF AND LABOUR SUPPLY.

SECTION 1.—STAFF.

99. *Staff.*—The present staff of the division is exhibited in the subjoined statement :—

A. Headquarters Staff.

Description.	Name of post.	Sanctioned strength.
Administrative	District Forest Officer	1
	Assistant to District Forest Officer ..	1
Ministerial	Head Clerk	1
	Accountant	1
	Clerks	5 (One temporary.)
	Draftsman	1
	Typist	1
Menials	Peons	5 (One temporary, under the Assistant to the District Forest Officer.)

B. Range establishment.

Description.	Name of post.	Tunacadavu range.	Pollachi range.	Punachi range.	Udumalpet range.
Executive	Range Officer	1	1	1	1
	Assistant Range Officer	1	..	..	..
Protective	Foresters	13 (One temporary.)	2	2	..
	Forest Guards	11 (Two temporary.)	8	7	10
	Reserve Watchers (temporary) ..	..	8	2	9
Ministerial	Range Clerks	2 (One temporary.)	2 (One for depot.)	1	1
Menials	Range Peons	1	1	1	1
	Bungalow Watchers (temporary).	1	1	..	..
	Depot Watchers (temporary) ..	..	2	..	..

C. Miscellaneous.

Assistant Veterinary Inspector	1 permanent.
Peon to Assistant Veterinary Inspector ..	1 permanent.
Telephone Linesman	1 permanent.
Road roller driver	1 temporary.

SECTION 2.—LABOUR.

100. *Local labour.*—The local Kadirs and Malasars are not nearly sufficient for all the works in the Tunacadavu Range, but outside labour, from the plains in the Coimbatore district and from the Cochin State, is available in large numbers to supplement this deficiency. There is no difficulty in procuring labour in other ranges, as well, Pulayars, Kadirs and Malasars settled inside the reserves supplying most of the requirements of the department. It is, however, necessary to organize the works in Tunacadavu Range so that resident labour may have opportunity to earn their wages all through the year.

101. *Ponam regeneration.*—In the Tunacadavu Range an extent of 100 acres is being regenerated under " ponam " during 1940, and in Punachi Range it has been found practicable to regenerate about 25 acres a year in the same manner. No difficulty need therefore

be anticipated in procuring sufficient local labour for the full extent of regeneration prescribed in this plan, but it will be necessary to provide work for them all through the year.

102. *Census of hill tribes.*—The subjoined list gives the latest census of hill tribes settled inside the reserved forests and available for departmental works, if sufficiently old :—

Locality.	Tribe.	Men.	Women.	Children.	Total.	Remarks.
		Pollachi Range.				
1 Sirkar porathy	Malasars	51	40	74	165	40 acres given free of tax.
		Udumalpet Range.				
2 Eshelthittu	Pulayars ..	6	6	13	25	
3 Parapatti	Do. ..	8	8	20	36	New settlement.
4 Elumalayankoil.. ..	Do. ..	1	1	3	5	
5 Thalinji	Do. ..	42	39	127	208	
6 Sarakkupatti	Do. ..	2	2	7	11	
7 Kodanthur	Do. ..	30	27	31	88	
8 Erumacholai	Muduvar ..	7	5	16	28	
9 Odukampathiyur ..	Malasars ..	1	2	1	4	
10 Pundi	Pulayars ..	34	26	40	100	
11 Eruvalaivu (Mavadap)..	Do. ..	32	18	32	82	
Do. ..	Muduvar ..	21	21	29	71	
12 Karuncholai (Thalamedu).	Pulayars ..	11	11	17	39	
13 Kurumalaipatti ..	Do. ..	26	31	52	109	
14 Jellimuthampatti ..	Do. ..	13	18	12	43	
15 Thirumurthykoil ..	Do. ..	5	3	5	13	
16 Thalayuthupatti ..	Do. ..	1	1	4	6	New.
17 Karisamadaipatti ..	Do. ..	1	1	5	7	Do.
18 Karumutti	Muduvar ..	18	22	16	56	Do.
19 Attumalai	Do. ..	8	7	16	31	Do.
20 Thinangadu	Do. ..	1	..	..	1	Do.
	Total ..	**268**	**249**	**446**	**963**	
		Punachi Range.				
21 Kallar	Kadirs	20	18	19	57	
22 Karungundu	Do.	9	8	26	43	
23 Eathakuli	Do.	1	1	5	7	
24 Kadamparai	Muduvars ..	16	24	29	69	25 acres given free.
Do.	Pulayars ..	3	3	7	13	
25 Lower Punachi	Do. ..	22	20	25	67	On kumri regeneration work.
Do.	Malasars ..	10	8	8	26	
26 Attakatti	Do. ..	1	1	3	5	
	Total ..	**82**	**83**	**122**	**287**	
		Tunacadavu Range.				
27 Anaipadi and Mondipathi.	Malasars ..	100	111	58	269	
28 Sungam	Do. ..	50	58	78	186	
29 Erumaparai	Mala-malasars ..	11	12	..	23	
Do.	Others	22	22	5	49	
	Total ..	**183**	**203**	**141**	**527**	

103. *Rate of daily wages.*—The daily wages for hill tribes are at present as follows :—

Range.	Men.	Women and boys.	Remarks.
	RS. A. P.	RS. A. P.	
Tunacadavu	0 7 0	0 4 0	Re. 0–8–0 are paid for axe work.
Pollachi	0 6 0	0 4 0	Boys—Re. 0–3–0.
Punachi	0 6 0 to 0 7 0	0 3 0 to 0 4 0	
Udumalpet	0 3 0	0 1 6	Women do not work.

104. *Disabilities noticed.*—The Pulayars of Pundi plateau are paid by the minor forest produce contractor in grain for collections and complaints were received that abnormally high prices were being charged by him. The Kadirs of Kalar complained that the Anamalai Planters' Association did not buy certain kinds of minor produce from them (e.g., honey, shekoy, dammars) nor did the Association permit them to sell such produce to others, thereby preventing them from earning as much as they might otherwise do.

CHAPTER V.—PAST SYSTEMS OF MANAGEMENT.

SECTION 1.—GENERAL HISTORY OF THE FORESTS.

A. Up to 1885.

105. *Kongumandalam and its antiquities.*—The tract surrounded by the Nilgiris, Vellamalais, Anamalais, Bargur and Toppur hills, Shevaroys and Pachamalais, is a compact block of plain country known in early days as "Kongumandalam." The district of Coimbatore and parts of Salem, Trichinopoly and Madura together made up this tract. Kistvaens, or ancient sepulchres, built of cut stones or hewn slabs, are sometimes met with within the area and are locally known as "Pandavar kulis": some of these may be seen at Pundi, on the Anamalais, about 14 miles south-west of Udumalpet. Old Roman coins have also been unearthed: articles of export to the Roman Empire included beryl, ebony, cinnamon, sandalwood, peacocks and their feathers.

106. *Political history.*—The kings of Chera (Malabar) and Pandya (Madura), the Pallavas, Gangas and Cholas have fought one another for ascendancy over the district. The Vijayanagar dynasty ruled over it for about three centuries, and after its fall, Mysore and Madura waged war against each other for its possession. Mysore held it during the eighteenth century and the British conquered it from them in 1799, at the fall of Seringapatam.

107. *Exploitation of the forests up to* 1850.—Before the time of British annexation the forests were subject to the unrestricted removal of all species except sandalwood, teak, *Dalbergia latifolia* and *Pterocarpus marsupium*. With the advent of the British started an era of wasteful extraction of teak from the Mount Stuart forests, in the shape of large planks, for the Indian Navy at Bombay and for the arsenal at Madras. The "Superintendent" of the Anamalai forests was Captain J. Michael, and he worked under the Civil Engineer from 1848 to 1853.

108. *From* 1850 *to* 1885 : *Mount Stuart forests.*—The Tekkadi forests were leased from the Raja of Kollengode in 1851, for a period of six years, the lease being renewed in 1857 for 99 years. A road was constructed from Topslip to Sichali and timber was carted up to Topslip, slipped down the ghat (whence the name "Topslip"), carted to Palghat, floated down the Bharata-puzha to Ponnani and shipped thence to Bombay. Timber for the Madras arsenal was carted to Vāngal (near Karur), on the Cauvery, floated down that river to the sea and shipped thence. A road from Sethumadai to Topslip displaced the "slipway" in 1868 and was in use until 1924 when it was replaced by the new ghat road. Timber supplies to Bombay were stopped in 1867 and transport by rail superseded floating in 1870. Felling continued up to 1880 when it was decided to give rest to the forest. The Mount Stuart forests were notified under the Madras Forests Act in 1883.

109. *From* 1850 *to* 1885 : *other areas.*—The Jungle Conservancy Department formed in 1868 appointed "Overseers" to look after the forests in Pollachi and Udumalpet taluks and all removals of forest produce were controlled by permits. The permits were free up to 1878 for *bona fide* domestic and agricultural requirements, but teak, sandalwood, and a few other species were not to be removed. A fee was charged for requirements other than domestic or agricultural. Tannadars checked removals against issued permits. In 1872 the Collector replaced the Jungle Conservancy Department and Rangers, Foresters and Forest Guards took the place of Overseers and Sub-overseers. Most of the reserved forests of the division were notified as such between 1883 and 1885.

110. *Administration* : 1850–1885.—The Madras Forest Department was created in 1856 with the appointment of Dr. H. F. Cleghorn, M.D., as the first Conservator of Forests. In 1879–80, the North and South Coimbatore divisions were amalgamated into one, the Anamalai forests being reduced to a range. The South Coimbatore division again became a separate division in 1885, but then included Mettupalayam and Bolampatty Ranges.

B. From 1886 *to* 1918.

I. Mount Stuart Forests.

111. *Mr. Porter's Working Plan.*—Mr. J. S. Gamble visited the Mount Stuart forests in 1885, made certain suggestions and emphasised the necessity for a regular working plan. Accordingly Mr. H. J. Porter prepared a working plan in 1885–86, which inaugurated another period of intensive exploitation. The annual yield was regulated under this plan so as to maintain a regular outturn for the first 30 years.

112. *Third lease with the Nambidi.*—The lease for 99 years entered into with the Nambidi (Raja) of Kollengode in 1857 was renewed in 1887. The lessor now agreed to the "perpetual extension or renewal of the same for like periods," a clause which changed

the whole aspect of the lease so that the Forest department was now in a position to contemplate the introduction of conservancy and regeneration on proper silvicultural lines. In fact, Government became to all intents and purposes the assured managers of the leased forest, in perpetuity.

113. *Tramway.*—In 1888, Mr. Porter started the construction of the Mount Stuart tramway, which was completed as far as Sungam in 1891, a distance of about 5 miles from Topslip. The tramway was of a 2-foot gauge laid on corrugated metal sleepers, the rails being 14 lb. per yard. The line was apparently laid without proper survey and innumerable difficulties in curves and gradients had to be surmounted after laying. Bullocks were used for traction. In 1904, a report showed that the line had been working at a loss all the time and that carting costs were cheaper. The tramline continued to function up to 1926 though it was in very bad order, when the present ghat road from Sethumadai to Anapadi was opened for traffic.

114. *Saw mill worked by water power.*—In 1898 Mr. Gass installed on the Tunacadavu river below Mount Stuart a saw mill worked by water power for the purpose of converting miscellaneous species other than teak which were not saleable at a profit in log form: subsequently teak logs were also sawn in it. An investigation in 1903 revealed that the saw mill was working at a loss. One of the chief reasons for the loss was the low annual outturn due to insufficient power developed by the poor water-supply and the rapid wear of the jet of the pelton wheel due to grit in the water. The saw mill was closed down in January 1909 when the dam which supplied the water to the saw mill was swept away by floods.

115. *Wire ropeway.*—A wire ropeway was also constructed by Mr. Gass in 1901 to convey sawn material from the head of the tramway at Topslip to the foot of the ghaut, so as to relieve the congestion of carting down the road, but this also ran at a loss and was unsatisfactory in many respects. The ropeway closed down in 1909, along with the saw mill.

116. *Mr. Wilson's reconnaissance report.*—In October 1916, Mr. C. C. Wilson completed a reconnaissance of the forests and recommended the division of the area into four working circles—the Karianshola Working Circle, the Bamboo Working Circle, the Mount Stuart Timber Working Circle and the Ulandi Timber Working Circle. Mr. Wilson went on military duty soon afterwards and Mr. H. F. A. Wood took over the preparation of the working plan, which was completed in 1918 on the lines proposed by Mr. Wilson, generally.

117. *Mr. Arbuthnot's Working Plan.*—"The British portion of the Mount Stuart Forests, which lies east of the Malabar boundary and north of the Vengolimalai-Umayamalai ridge, was given rest from 1885. In 1909 Mr. Arbuthnot prepared a working plan for this portion of the forest which was sanctioned in B.P. Forest No. 125, dated 5th May 1911. The plan prescribed certain silvicultural operations without any fellings. These were carried out to a certain extent but owing to lack of control the results of the treatment have mostly been lost. The work ceased after 1915 because all available labour was taken by the working plan party and the Forest Engineer." [M. V. Laurie.]

118. *The Ulandi valley.*—Prior to 1906 no work was done in the Ulandi valley, as far as is known, on account of its inaccessibility. In 1906, a working plan, known as the Varigali Valley Working Plan, was made by Mr. Arbuthnot for exploiting this area, as the construction of a road over the Vengoli-Umayamalai ridge was contemplated. The first coupe was felled between November 1911 and March 1913. Unfortunately the contemplated road did not materialise. Part of another coupe was worked departmentally between 1913 and 1918.

II. Other areas.

119. *Timber from Punachi and Navamulai.*—In 1886, presumably under the permit system, a contract for the removal of valuable timber, such as *Dalbergia latifolia* and *Pterocarpus marsupium*, was given to a timber merchant. Timber was skidded down extensively from Punachi to Navamulai and then carted to Pollachi.

120. *Punachi and Thalinji forests.*—A working plan for Punachi, prepared by Mr. Arbuthnot, was sanctioned in 1908. This remained in force till 1925. A plan for Thalinji prepared by the same officer in 1909 was not put into operation since there was no market, the timber possibilities had been exaggerated and the question of grazing had to be considered separately.

121. *Fuel forests.*—In 1889, Mr. Porter drew up a working plan for about 2,400 acres of forest south of Sethumadai, to be worked for fuel on a rotation of 12 years. This was subsequently revised by Mr. Bryant but neither plan was sanctioned. From 1890, however, fuel fellings were localised and in 1896 a working plan prepared by Mr. Gass was sanctioned for the Ayerangal fuel series of 800 acres. In 1902 Mr. Foulkes prepared two

working plans, one for the Pollachi Range and the other for the Udumalpet Range, constituting the Kottur, Amaravathi, Kamanuthu and Dhali Felling Series. The Gudaravalli series was opened in 1907 and the Pachathanni series in 1911.

122. *Evergreen forests.*—The earliest attempts to market evergreen timber were during the years 1903–1905. *Mesua ferrea, Calophyllum tomentosum, Dysoxylum malabaricum, Artocarpus integrifolia* and *Cedrela toona* were felled in Andiparai shola near Iyerpadi and sold at Anamalai. The operation resulted in loss. No railway sleepers of *Mesua ferrea* appear to have been sold at that time.

123. *Coffee and tea planting.*—In 1896, Government approved the grant of leases on the Anamalais for the planting of coffee, tea, cardamoms, etc., and since then an area of 47,232 acres of reserved forest has been taken up for the purpose by European planters. The assignment permitted the planters the use of any timber from their area for their own purposes but not for sale; much timber was felled and wasted on this account.

C. From 1919 *to* 1940.

I. Mount Stuart Forests.

124. *Mr. Wood's Working Plan.*—Mr. Wood's working plan, which included the Tekkadi leased forests, the British portion of the Mount Stuart forests and the Ulandi forests, came into force on 1st April 1919. Large quantities of timber lying felled in the forest for want of carting facilities were transported to Pollachi depot between 1916 and 1919, the period of preparation of the working plan. Fellings under the working plan added to this stock and in 1926 there was a heavy unsold stock at Pollachi, due mainly to lack of appreciation of the general market depression following the Great War.

The headquarters of the range were removed from Mount Stuart to Topslip in 1927, on account of the unhealthiness of the former.

125. *Saw mill.*—In order to clear off the accumulation of timber a semi-portable saw mill was installed in 1926 at Pollachi. Since it failed to show a profit at Pollachi, it was removed to Topslip in 1928, but was eventually closed down on 31st December 1929 as it fared no better there.

126. *The Ulandi valley.*—In order to compensate the contractor who had incurred losses in previous contracts in the Ulandi forests, some timber was sold to him from Palakadavu. This exploitation was completed in 1922.

127. *Elephant capturing in Tekkadi leased forest.*—The lease of 1887 did not permit the lessee to capture elephants within the Tekkadi leased forest. In 1921 an agreement was made with the Raja of Kollengode permitting Government to captûre elephants within the leased area.

This agreement was renewed in 1926 and 1929 with some alterations.

128. *Topographic survey of Karianshola.*—In 1926, the Logging Engineering Division carried out a 50 per cent enumeration and topographical survey of Karian shola.

129. *Mr. Laurie's Working Plan.*—In 1927, it was decided that Mr. Wood's working plan should be revised suitably and Mr. M. V. Laurie commenced field work in November of that year. His working plan came into force on 1st April 1931.

II. Other areas.

130. *Punachi forests.*—In 1925, Mr. Coode prepared a revised working plan for the Punachi Working Circle. This working plan was revised by Mr. A. N. Sarma, for the period 1935–36 to 1944–45, and he re-named the Punachi Working Circle as the " Plantation Working Circle."

131. *Fuel forests.*—The informal opening of new felling series referred to in the last sentence of paragraph 121 continued up to 1920 when a " Summary of prescriptions " was made by Mr. Crothers for the working of Pothamadai, Gudaravalli, Ayerangal, Pachathanni and Kottur fuel series, all of which were reconstituted in 1920–21. In 1923, Mr. Dyson drew up a working plan to regularize the working in Pollachi Range. Keerapadi and Nallar fuel series were opened for the first time in 1932. And Mr. Sarma's working plan for the forests of Coimbatore South Division (1935–36 to 1944–45), brought all the fuel forests of the Pollachi and Udumalpet Ranges under one Fuel Working Circle.

132. *Evergreen forests.*—In 1927, an area of 23,000 acres of reserve in the Kalar Valley was set apart for the planting of cinchona by Government.

Between 1925 and 1928, the Logging Engineering Division " cruised " the evergreen forests of the Kalar Valley, since the clearing of shola forests for planting of cinchona drew attention to the possibility of utilising some of the valuable species in them. As an experimental measure some 6,000 broad gauge sleepers of *Mesua ferrea* were supplied at

Pollachi to the South Indian Railway by the Logging Engineer and the transaction was found profitable. The exploitation for *Mesua* sleepers was therefore continued by the Forest Engineering division up to 1930 after which the District Forest Officer undertook the work. The operation was discontinued in 1933 as the sale price of the sleeper was so reduced by the railways as to make the supply unprofitable. In addition to sleepers of *Mesua ferrea*, small quantities of sawn sizes of *Palaquium ellipticum*, *Calophyllum elatum*, *Dysoxylum malabaricum* and *Cedrela toona* were also sold at a small profit. Mr. Sarma's working plan for the forests of the Coimbatore South division (1935–36 to 1944–45) prescribed the exploitation of part of the Kalar Valley sholas for *Mesua* sleepers under a Selection Working Circle.

An area of 1,300 acres was planted up with cinchona by 1934 and Government have recently ordered further planting to the extent of 1,500 acres in the next five years.

133. *Coffee and tea planting.*—The allotment of about 47,232 acres of reserved forest in Punachi Range for planting of tea, coffee, etc., referred to in paragraph 123 above was disreserved in 1926 and excluded from administration by the Forest department.

SECTION 2.—PAST SYSTEMS OF MANAGEMENT AND THEIR RESULTS.

I. Mount Stuart Forests.

A. Up to 1885.

134. *Exploitation up to* 1880.—At the beginning of the nineteenth century the Mount Stuart forests were much richer in teak than they are now. When engaged on the trigonometrical survey of the tract (about 1820) Ward and Connor mention that the growth of teak in these forests far surpassed anything they had seen elsewhere. The Government forests and the neighbouring Tekkadi forests of the Nambidi of Kollengode were worked from before 1839 continuously until 1880 to supply teak to the Bombay Naval Dockyard and the Madras Arsenal. The supply was in the shape of planks 3 to 8 inches thick, made by splitting logs with wedges and trimming with the axe, so that the wastage must have been frightful. In 1849, Major Cotton and Captain Michael estimated that the Government and leased forests contained 18,350 trees of 3,670,000 cubic feet, suitable for felling but in 1866 Captain Beddome reported that the forests required complete rest for 15 or 20 years, and that, with the exception of a few knotted and twisted trees, there was no teak of any size left. Though extraction probably decreased in 1862–63, large quantities were removed till 1880 when the " rest " prescribed in 1866 was given effect to.

135. *Lease of* 1851.—Government recognised in 1850 the ownership of the Nambidi of Kollengode to the Tekkadi forests which were leased to Government in 1851 for a period of six years. The lease was for teak only, the stump fee was Rs. 5 and an advance of Rs. 7,500 for 1,500 trees was given to the Nambidi.

136. *Lease of* 1857.—The lease of 1851 was renewed in 1857 for a period of 99 years. The British Government obtained complete control of all timber in the leased area, the Nambidi reserved to himself the rights to honey, ivory, cardamoms and such hill produce, the " customary right " of hill tribes to cut jungle wood for their own proper use was not to be interfered with and such rules for conservancy as they deemed fit could be made by the British Government. The stump fee for teak and rosewood was Rs. 6 but was only Rs. 2–8–0 for *Lagerstrœmia lancelota*. An advance of Rs. 30,000 was made to the janmi, free of interest, and this was to be wiped off first from future stump fees.

137. *Conservancy.*—The question of conservancy and improvement was not altogether overlooked though little was achieved owing to the insecurity of the tenure due to the terms of the leases then subsisting. During 1856 Captain Hamilton appears to have made a plantation of 2 acres in the British portion, which was discovered in a neglected condition by Captain Beddome in 1869–70. In 1871, Mr. Douglas made a plantation of 8 acres at Topslip which cannot now be located; it was known as the " Mudi " plantation. In 1872–73, a further 8 acres were planted at " Waterfall," about 1½ acres of which is now a good plantation in which a sample plot has been established. In 1874, a further 3½ acres were planted which cannot be located now, and from 150 to 200 acres of forest were cleared of brushwood, creepers and useless saplings and attempted to be protected against fire.

138. *General condition in* 1880.—In 1880, the forests had been severely depleted by heavy fellings of teak, leaving the less useful and the absolutely useless species to increase. Natural regeneration of teak was conspicuous by its absence. A few spasmodic efforts at regeneration had been made most of which had been expensive failures. Fires raged for 8 to 10 days together and no protection had been attempted against them.

139. *Rest and the first working plan.*—The forests were given rest from 1880 to 1885. In 1885, Mr. Porter prepared a working plan for the Tekkadi forests " with a view to

ascertain the probable outturn of the forest and its value, so as to obtain a rough basis for changing the terms of the lease," pointing out that an elaborate working plan was useless until security of tenure and continuity were established.

B. 1886 to 1918.

140. *Prescriptions of Mr. Porter's Working Plan.*—The leased forest, for which alone Mr. Porter's plan was prepared, was divided into 39 compartments, totalling 17,140 acres, and valuation surveys were carried out over 2½ per cent of the area. The system of working was the exploitation of the best timber as it became mature, no provision being made for regeneration or improvement. The most useful size of teak was 2 to 2½ feet in diameter (at stump height) and ring countings showed that this could be attained in 120 years. The rotation of 120 years was divided into four periods of 30 years each, the felling cycle being fixed at 30 years, the length of a period. The yield was fixed by " number of trees " based on the valuation surveys referred to above.

141. *Results of working of Mr. Porter's plan.*—Fellings under this plan started in 1886 and continued until 1915. The prescribed sequence of coupes was altered at the very outset to suit the extraction schemes represented by the tram line, the slip, the ropeway and the saw mill. The fellings fell short of the quantities estimated, and the enumeration was found to be inaccurate. Beyond proposals for fire protection and restriction of grazing, no cultural operations were prescribed and it is not known to what extent the former were carried out.

142. *Revised lease with the Nambidi.*—The third and most important lease with the Nambidi of Kollengode, aforesaid in paragraph 136 above, was ratified in 1887. This lease is still in force and was the result mainly of the energetic representation of Mr. H. J. Porter, who was District Forest Officer at the time. The unexpired portion of the previous lease was re-affirmed and the lessor now agreed to the " perpetual renewal or extension of the same for like periods." All rights in the land were extinguished, except (*a*) the right of way for the janmi's timber and produce along the cart-track from Tellikal through the leased forest to the Gudaravalli forest, and the branch track which crosses the Tekkadi river, and the right to use the timber slip down the Ayyaswamimudi ridge, (*b*) right to store timber at the bottom of the said slip and (*c*) right to all elephants captured accidentally or otherwise (since altered). The British Government was debarred from taking steps to capture elephants (since altered) and to quarry or mine for precious metals or stones. The payment of stump fees was abolished in favour of fixed rental. The rental was fixed at Rs. 5,000 per year for the first 80 years. Should the British Government desire to renew the lease, a renewal fee of Rs. 5,000 for the first term, Rs. 6,000 for the second and Rs. 7,000 for every subsequent term would be payable. The annual rental for the first extension was fixed at Rs. 5,000, Rs. 7,500 for the second and Rs. 10,000 for every subsequent extension. Rental was to be paid on the 1st April and 1st October of every year, interest at 1 per cent per month accruing after the expiry of one month from due dates. If payment fell in arrears for over three calendar months the lessor would be at liberty to determine the lease absolutely.

143. *Effect of the lease.*—Under this lease Government became the assured managers of the leased forest, *in perpetuity*, to all intents and purposes. The questions of conservancy and regeneration began to be considered seriously, on account of this alteration in status, and experiments were made in order to obtain natural and artificial regeneration, but with little substantial result.

144. *Sylviculture.*—No regulated scheme for regeneration or improvement was added to Mr. Porter's working plan of 1885, but Mr. Porter himself was the first to arrive at the conclusion, in 1888–89, that the system of " jardinage " was unsuited to the natural reproduction of teak and other valuable species at Mount Stuart and that the " mode des eclaircies " should be substituted instead. Various attempts were made from time to time to obtain natural regeneration by opening out the canopy but the resulting dense mass of creepers and weeds killed out any regeneration.

145. *Mr. Popert's report.*—In 1894, Mr. E. P. Popert, Conservator of Forests, inspected the forests and reported that the system of " jardinage " should be given up and substituted by improvement fellings and cultural operations. Teak trees over 2 feet in diameter were not to be felled unless there was sufficient natural regeneration of that species, all trees of less valuable species dominating teak, rosewood or vengai, were to be felled or girdled, and dibbling of teak, rosewood and vengai was to be undertaken in blanks. He also advocated planting by " taungya." He could offer no suggestions for the eradication of lantana which was spreading rapidly.

146. *Mr. Lushington's experiments.*—Between 1898 and 1911, attempts were made to obtain natural regeneration by felling bamboos and cutting out inferior species, but satisfactory stocking was not achieved and the expenditure was incommensurate with the

results. In 1908 to 1910, Mr. P. M. Lushington cut out bamboos, burnt the area and dibbled teak therein with fair initial success but lack of subsequent tending failed to yield permanent results. At about the same time, Mr. Lushington clear-felled an area on the south side of the tramline near Topslip and dibbled in it germinating teak seeds from dumps. Mr. K. R. Venkatarama Ayyar, who was then Range Officer, did most of the work himself. Guinea grass was put in subsequently with the main idea of suppressing the weeds and this spoiled a very promising experiment since wild animals were attracted by the grass and trampled down the teak.

147. *Mr. Arbuthnot's Working Plan.*—Mr. Arbuthnot's Working Plan for the British portion of the forest east of Mount Stuart was sanctioned in 1911. This plan prescribed no timber fellings. The area was divided into three parts. In one part, inferior species interfering with superior species were to be girdled, in the second, 30 acres were to be cleared and planted each year, while the third portion, including Karianshola, was to be given rest. Between 1911 and 1913 inferior species were girdled accordingly over 318 acres which helped a number of young teak, *Dalbergia latifolia* and other species, as also weeds and lantana at the same time. A clearing of these weeds and lantana was ordered in 1916 but the operation could be carried out only over part of the area owing to other demands on the available labour.

148. *The Ulandi Valley.*—Mr. Arbuthnot's Working Plan for the Varigali Valley (1906) divided the Ulandi Valley forests into ten coupes of about 250 acres each and 439 trees were prescribed for annual exploitation. The first coupe which yielded 47,034 cubic feet was felled between November 1911 and March 1913, but the construction of the road over the Vengolimalai ridge by which this timber was to be transported was commenced only in 1912, and was abandoned soon after on the ground of bad alignment. A contractor from Palghat bought 34,535 cubic feet of this timber for Rs. 16,293 but did not pay for it till 1918. In the meanwhile, part of Coupe IX of same plan was worked departmentally, yielding 2,885 cubic feet of teak and rosewood which the same contractor bought for Rs. 2,885. He also took in the same year, for Rs. 1,250, 2,576 cubic feet of teak and rosewood obtained from the clearing of the Cochin boundary. All this timber was exploited down the Cochin tramway to Chalakudi by 1922.

149. *Sylviculture in Ulandi Valley.*—The working plan of 1906 prescribed certain sylvicultural operations to ensure the reproduction of teak and rosewood; these have been described in paragraph 147 above. None of these operations was carried out till 1916. In 1916, however, Mr. Wood succeeded in regenerating plots 2 chains square by dibbling of teak seeds after burning and by subsequent careful weeding; these experiments are referred to in paragraph 152 below.

150. *Planting between* 1912 *and* 1915.—Between 1912 and 1915 about 112 acres were clear-felled and planted with teak and *Dalbergia latifolia* on the south side of the tramline near Topslip. Guinea grass was introduced into the plantation in order to keep down weeds, with the same disastrous results as were noticed in paragraph 146 above. The area is now a mass of bamboo except for a small patch of flourishing teak on the old nursery site where guinea grass was not planted. The plantation did so badly that teak planting was given up for some time on the plea that it was unsuitable.

151. *Mr. Wilson's reconnaissance report.*—In 1916, Mr. C. C. Wilson submitted reconnaissance report on the Mount Stuart forests in which he recommended the division of the area into four working circles, viz. :

(1) *The Karian Shola Working Circle*, which was not to be worked since it was an evergreen forest and the source of many streams.

(2) *The Bamboo Working Circle.*—To be leased out for clear-felling and to be followed by concentrated regeneration of teak and other timber species.

(3) *The Ulandi Timber Working Circle.*—The method of exploitation of which was to be decided on the result of an enumeration survey.

(4) *The Mount Stuart Timber Working Circle.*—This consisted of the Tekkadi leased forest as well as the British forest east of Mount Stuart, with a total area of about 15,000 acres. It was to be worked by selection fellings of teak and other species and under a scheme of *clear-felling with natural regeneration*, by which the whole forest was to be re-stocked with teak in 150 years at 100 acres per year. Mr. Wilson proposed to rely on natural regeneration probably because of the failure of the artificial regeneration work done between 1912 and 1915 and referred to in paragraph 150 above. Mr. Wilson went on military duty in 1916 and Mr. H. F. A. Wood, then the District Forest Officer, took over the preparation of the working plan.

152. *Mr. Wood's experiments at artificial regeneration.*—Mr. Wood did not believe in regenerating teak naturally. He therefore carried out experiments both near Mount Stuart bungalow and in the Ulandi Valley, in 1916 and 1917, which proved that teak plantations could be raised successfully from seed and at a reasonable cost; these have been described in detail in paragraph 258 of Mr. Laurie's Working Plan. Complete clearing and burning, dibbling and proper weeding were found to be essential for success and drip from trees overhead was inimical to proper growth.

C. 1919 to 1930.

153. *Prescriptions of Mr. Wood's Working Plan of* 1919.—Mr. Wood, who took over the preparation of the working plan for which Mr. Wilson prepared the reconnaissance report in 1916, agreed generally with Mr. Wilson's proposals, but advocated the substitution of concentrated artificial regeneration of teak at 25 acres per annum for Mr. Wilson's natural regeneration of 100 acres every year. A fifty per cent enumeration over the whole of the forest (including Ulandi valley) was carried out and the numbers of trees and volume of growing stock were worked out for each of Mr. Porter's compartments. The selection system was prescribed with a minimum girth limit of 7 feet and a felling cycle of fifty years. An extent of 25 acres of the best locality within each coupe was to be clear-felled, burnt over and regenerated with teak by dibbling; a greater area could be attempted if sufficient labour was available. Lantana was to be eradicated and teak seed sown in the areas so dealt with. Protective measures against fires were also prescribed.

154. *The fellings.*—The yield for the first felling cycle of 50 years was calculated at not less than 100,000 cubic feet per annum, of timber of 7 feet girth and over. The annual coupes were laid out, however, to give approximately equal yields of 89,000 cubic feet every year, though the reason for adopting this figure was not given. The quantity of timber felled in any one year did not correspond either with the estimated outturn or the calculated yield. Also the order of the coupes felled did not correspond with the order prescribed. The minimum quantity felled in any one year was 15,875 cubic feet in 1920–21 and the maximum was 152,129 cubic feet in 1922–23. In the eleven years between 1919–20 and 1929–30 a total of 1,114,937 cubic feet was felled, giving an annual average of 101,358 cubic feet. Of these timber of 7 feet girth and over was only 634,624 cubic feet or about 63,462 cubic feet per year (there was no selection felling in 1920–21) which is about two-thirds of the calculated yield.

155. *Regeneration.*—The working plan contemplated an annual regeneration area of 25 acres only but the area was gradually increased to 250 acres in 1925 and 1926. This was then found to be too unwieldy for efficient regeneration and was consequently reduced later. The areas regenerated from 1915 to 1930 and the cost per acre are given below :—

Year.	Area in acres.	Cost per acre.		Year.	Area in acres.	Cost per acre.
		RS.				RS.
1916	5	39		1925	250	67
1919	28	46		1926	251	64
1920	8	105	Failure.	1927	155	64
1921	29	59		1928	144	55
1922	126	51		1929	151	58
1923	193	54		1930	224	48
1924	226	47				

The cost of the various items of regeneration operations ranged as indicated below for the period 1927 to 1929 :—

Felling useless species and bamboos	Rs. 15 to 21 per acre.	Weeding and replacements, first year	Rs. 16 to 22 per acre.
Burn and reburn ..	,, 7 to 9 ,,	Weeding and replacements, second year	,, 7 to 11 ,,
Staking and dibbling ..	,, 2 to 3 ,,		
Seed collection and nursery.	,, 1 to 3 ,,		

156. *Species planted.*—Teak was planted pure before 1926 except in certain swampy localities where *Terminalia tomentosa* was introduced. In 1926, 1927 and 1928, alternate strips of *Dalbergia latifolia* were sown. In 1929 pure teak was again reverted to, except in a small area where teak and *Dalbergia latifolia* were sown at the same stake, and in 1930 the whole of the regeneration area was treated in this manner.

157. *Method of regeneration.*—Burning and clearing the area was completed early in March or before and the area staked at an espacement of 4½ feet by 4½ feet. Teak seed was dibbled in loosened patches at each stake at the end of March and seeds of *Dalbergia latifolia* and other species in early June, just before the monsoon. About six seeds were sown at each stake. Weed cutting commenced in May, before the teak had germinated, and proceeded almost continuously to the end of September or early October, the ground being gone over six or seven times. Casualties were replaced during weeding by transplanting excess seedlings at stakes, or by germinating seeds or nursery transplants.

158. *Karianshola.*—No fellings were carried out in Karianshola. Existing *Hopea* regeneration was tended by regulated removal of trees of useless species in the lower and middle storeys.

159. *Fire protection.*—Mr. Wood's system of fire protection was carried out in a modified form for three years and then abandoned since all available labour was absorbed by regeneration operations. Subsequently only the regeneration areas and timber depots were protected.

160. *Lantana eradication.*—Eradication of lantana was attempted by uprooting but this was discontinued in 1921 as it was found to be expensive and ineffective. Under Mr. Tireman's orders, burning was tried in 1925 and 1926, but this treatment discouraged the weed only temporarily and destroyed most of the existing regeneration of timber species.

161. *Defects of Mr. Wood's Working Plan.*—(*a*) When large areas of over 150 acres were taken up for regeneration, the total calculated annual yield was obtained from clear-fellings alone so that there was no need to do any selection fellings. The forest was therefore not being worked to its best capacity as parts requiring felling were left unfelled. (*b*) In selecting regeneration areas of hundred acres or more within a coupe of about 500 acres, it frequently happened that unsuitable areas were included, resulting in complete failures. (*c*) Gradual but certain regeneration of the forest was inevitable due to insufficiency of natural regeneration of valuable species to replace the timber extracted in selection fellings and the failure to provide measures of cultural improvement following exploitation.

162. *Thinnings.*—It was found that in the best quality areas a thinning was necessary in the fifth or sixth year. Second thinnings were found necessary only in 1916 and 1919 plantations. A cleaning and climber cutting done just before thinning was found beneficial in preventing breaking off of the crowns of trees to be retained : also, the cleaning could then be inspected by the marking officer.

The following statement shows the areas thinned, cost and yield :—

Plantation.		Year of thinning.	Area in acres.	Cost. RS.	Yield in poles.
Waterfall		1919–20	12	10	120
Mount Stuart,	1916	1922–23	5	8	323
Do.	1917	1923–24	Not known.	..	130
Topslip,	1917	Do.	Do.	9	175
Regeneration area,	1919	1924–25	29	96	..
Do.	1921	1926–27	29	21	..
Do.	1922	1928–29	45	97	5,478 (for the four rows)
		Do.	80	181	
Do.	1923	Do.	160	162	
Do.	1916	Do.	5	9	
Do.	1919	1929–30	29	49	1,095
Do.	1924	Do.	226	2 1	1,900

163. *Experiments.*—A series of experiments on regenerating various species was undertaken between 1926 and 1930. The results are summarized below : further details will be found in Mr. Laurie's Working Plan.

(1) *Artocarpus hirsuta as underwood in teak plantations.*—The experiment failed when tried in 1925 and 1926 in the 1922, 1923 and 1924 plantations. The plants did not survive the hot weather for want of sufficient shade.

(2) *Acrocarpus fraxinifolius.*—In 1927, a corner of the regeneration area of the year was sown with *Acrocarpus fraxnifolius*. The species grew very fast but was attacked by a stem borer and bison and sambhur stripped off the bark. It is growing fairly well now, however.

(3) *Adina cordifolia.*—After keeping sufficient mother trees of *Adina cordifolia*, the ground was cleared and burnt in March 1926. Weeding was done in June and germination of *Adina* in dense patches was noticed in August, over 50 per cent of the area treated being densely covered with pure *Adina* regeneration. Some seedlings of teak, *Dalbergia latifolia*, *Pterocarpus marsupium* and *Terminalia tomentosa* had also come in naturally. In 1927, the *Adina* seedlings averaged 9 inches in height and in October, the average height was 5 feet 9 inches. In August 1928, the average height was 8 feet.

164. *Gap regeneration in selection forests.*—In 1928 Mr. Laurie carried out experiments with a view to evolve some means of artificial regeneration suitable to the simple selection system as carried out in mixed deciduous forest, since natural regeneration had proved insufficient. Some 30 gaps were selected in the selection felled coupe of 1927, each about 50 feet in diameter. The branchwood from felled trees was billetted,

stacked and burnt by the middle of March and seeds of teak, *Pterocarpus marsupium*, *Dalbergia latifolia* and *Terminalia tomentosa* were dibbled in loosened patches 3 to 4 feet apart. Weeding was done in August and October. Browsing of all seedlings was noticed except in the case of teak. The effect of drip was noticeable on teak. The experiment established that (1) the area of the burn for gap regeneration should be as large as possible, (2) the burn should not be too hot, (3) fire protection of each individual gap was expensive and difficult and (4) more tending was necessary than was done. It was estimated that a gap could be regenerated thus for about a rupee. Of these results, gap regeneration was prescribed experimentally in Mr. Laurie's Selection Working Circle.

A review of the results obtained in various forests throughout the Presidency was made in 1938 and the following conclusions were arrived at :—

(1) In all forests the attention paid to the gaps exposed them to excessive damage from browsing animals.

(2) In teak forests, seedlings were frequently burnt by sporadic fires.

(3) They could not be protected from the damage noted in (1) or (2) without incurring an expenditure out of all proportion to results achieved.

(4) Satisfactory natural regeneration was generally achieved in areas which contained no 'gaps.'

All attempts at regeneration by 'gap' method were therefore abandoned towards the end of 1938.

165. *Elephant capturing in Tekkadi forest.*—The lease of 1887, it may be remembered, did not permit the lessee to capture elephants within the Tekkadi leased forests. Damage to teak regeneration by increasing herds of elephants induced Government to enter into an agreement with the Raja of Kollengode in 1921, under which Government was permitted to capture elephants in the leased area. All elephants caught were valued by the lessee subject to revision by the Raja. The lessee was to bear all the costs of capturing and training but had the first option of retaining the capture, on payment of half its estimated value. If the lessee did not wish to retain the elephant, the Raja could keep it on paying half the value. If neither wished to retain the animal, the sale-proceeds by auction would be divided equally between the lessor and the lessee. This agreement was renewed in 1926 for a further period of three years. It was found however that the lessee often suffered a loss under the conditions of the lease and therefore a provisional agreement was entered into in July 1929 which fixed the cost of capturing and training an elephant at Rs. 250 and this amount was to be deducted from or added to the value of elephant according as the lessee or the lessor wished to retain it. If the elephant was sold in auction the sum of Rs. 250 was to be paid to the lessee out of the sale-proceeds and the balance divided equally between the Government and the Raja.

II. Other areas.

A. Up to 1885.

166. *Permit system.*—In 1868, the Jungle Conservancy department appointed overseers in charge of the forests in Udumalpet and Pollachi taluks and an overseer for the collection of minor forest produce on the Anamalis. The village headmen were supplied with permits to be issued for removal of forest produce. Free permits were issued up to 1873 for *bona fide* domestic and agricultural purposes. Teak, sandalwood, *Dalbergia latifolia*, *Pterocarpus marsupium*, *Acacia sundra* and *Acacia arabica*, *Anogeissus latifolia*, *Tamrindus indica* and *Terminalia arjuna* were not sold on permits, nor green fuel. The fees charged were :—

	Head-load.	Cart-load.
	RS. A. P.	RS. A. P.
Timber	0 1 6	1 4 0
Fuel (dry)	0 0 3	0 5 0
Bamboos	0 0 6	0 10 0

In 1876–77, the price of fuel (green or dry) was raised to a rupee per cart-load but was reduced to the old level in 1878.

167. *Grazing.*—Grazing was free in reserved forests till 1888.

168. *Fire-protection.*—There was no fire-protection.

169. *Minor produce.*—In 1868, an overseer supervised the departmental collection of minor produce. In 1879, the right to collect and enjoy minor forest produce was allowed to resident hill tribes, without prejudice to the right of Government to collect them, sales being allowed only to Government or their agents. This right was recognized at the time of forest settlement.

B. 1886 to 1918.

170. *Working plan for Punachi forests*, 1908.—The working plan of 1908 prescribed the following treatment for the Punachi forests :—

(i) The area was divided into 20 compartments.

(ii) Selection fellings, of trees over 6 feet breast height girth and of unhealthy trees of teak, rosewood and *Pterocarpus marsupium* over 4½ feet breast height girth, subject to a limit fixed for each compartment.

(iii) Improvement fellings, in which all trees of inferior species interfering with valuable trees were to be removed.

(iv) Regeneration fellings, consisting of the removal of all inferior species within a radius of one chain from living trees of valuable species likely to interfere with natural regeneration of such species, coupled with breaking up of the soil within this radius. Artificial aid was to be given to the natural regeneration where necessary.

(v) Fire-protection was prescribed.

171. *Results of working*.—Compartments 1, 3, 4, 5, 6, 8, 9, 10 and 11 were worked from 1904 to 1918. The yield limit was exceeded. Improvement fellings were also carried out as well as weeding and uprooting lantana. The regeneration fellings were given up in 1915–16 as they were found to produce no results. Fire lines were burnt regularly.

172. *First artificial regeneration*.—In 1916–18, Mr. H. F. A. Wood selected 24 plots, each 2 chains square, cleared and burnt them and dibbled them with teak seed. Some of these plots may still be identified by the teak trees standing on them.

173. *Fuel forests—The working plan of* 1896.—Mr. Gass's Working Plan for the Ayerangal Fuel Working Circle of 800 acres prescribed the coppice with standards system on a rotation of 25 years for the coppice. Not less than 25 standards were to be retained and the working was to be departmental. Cleaning of creepers and weeds was prescribed for two years. This plan was worked for one rotation.

174. *The Pollachi Fuel Working Plan of* 1902.—Mr. Foulkes prepared a working plan in 1902 for the rest of the outer slopes of the Anamalais in Pollachi range, treating Mr. Gass's Working Plan as a part. The Kottur Fuel Working Circle of 2,800 acres was constituted under this plan, to be worked on the coppice with standards system on a rotation of twenty years. The maximum number of standards to be retained was 40 to the acre, if that number could be found. No cleaning or weeding was prescribed but *Cochlospermum gossypium* and *Balasamodendron berryi* were to be felled. Palmyra was to be sown and planted by subordinates along external boundaries, free of cost.

175. *The Udumalpet Fuel Working Plan of* 1902.—A working plan was also prepared by Mr. Foulkes in 1902 for the Amaravathi valley forests constituting the following fuel felling series :—

The Amaravathi valley felling series of 5,168 acres.

The Kamanuthu valley felling series of 6,092 acres.

The Dhali felling series of 3,203 acres.

The system was coppice with standards but the rotation was only fifteen years. Standards were to be introduced, for lack of suitable ones, by planting timber species. Sowing of species suitable for manure leaves was also prescribed but no cleaning. Palmyra fruits were to be sown by subordinates free of cost. The annual coupes extended over 150 to 720 acres and, by 1918, the fellings fell very much into arrears owing to difficulty in procuring sufficient labour and to the fact that the coupes were demarcated too high up the hillside.

176. *Informal opening of new felling series*.—The Gudaravalli and Pachathanni fuel felling series were opened in 1907 and 1911, respectively, in the " Western Closed Working Circle " of Mr. Foulkes Pollachi Working Plan of 1902, and were worked regularly.

177. *Bamboos*.—The earliest reference in working plans to the exploitation of bamboos is in the 1896 plan for Ayerangal where it was prescribed that bamboos in the Ayerangal block would be cut and sold departmentally. Mr. Foulke's Working Plan of 1902 did not prescribe any bamboo fellings on the ground that they were marketable only to a very small extent. Since 1916, successful attempts were made to sell the bamboos in Udumalpet range on a three-year felling cycle.

178. *Minor produce*.—The departmental collection of minor produce was continued. In 1905–06, the Anamalais Planters' Association bought the right to collect the minor products in Punachi range since it gave them control over local labour and reduced theft from their estates. This arrangement continued and in 1913–14, the lease was extended over the Punachi and Ulandi ranges and a portion of Pollachi range for Rs. 330 a year.

179. *Grazing.*—In 1888, grazing permits were introduced for the first time, the rates being 8 annas for buffaloes, 4 annas for cows and 2 annas for sheep. Goats were excluded. In 1898, the rates were altered to 6 annas, 3 annas and 1½ annas, respectively. There have been several changes in rates since then. Penning was permitted in approved pens and each permit holder was charged a rupee for the concession.

Mr. Gass's Working Plan of 1896 prescribed the closure of the whole working plan area to grazing but Mr. Foulke's plan of 1902 closed only felled coupes for a period of five years after felling.

180. *Fire-protection.*—Fire-protection was first introduced in 1888–89. In 1902, Dhali reserve and an area of 10,000 acres between Pothamadai and Pachathanni, on the hill slopes, were under protection. Rights of way were firetraced and fire patrols employed. The coupes of Udumalpet range were also protected by fire lines and patrols. The Punachi Working Plan of 1908 mentions that 43 miles of fire lines had been formed till that date within the working circle.

C. 1918 to 1934.

181. *The Punachi Working Circle.*—In the Punachi Working Circle, compartments 2, 8, 9, 10, 11, 12, 13, 14, 15 and 16 were exploited from 1918 to 1922–23. An area of about 65 acres was cleared and burnt between 1922 and 1925 and dibbled with teak seeds but only about 38 acres were successfully stocked at a cost of about Rs. 30 per acre.

182. *Results of working in Punachi Working Circle up to* 1923.—The working plan of 1908 was revised in 1925 and the Working Plan Officer's verdict on the working of the 1908 plan was as follows :—

> "Overcutting and reduction of stocking density, unwise retention of many unsound stems, waste of money on improvement fellings, on regeneration fellings, on weeding (of natural regeneration areas) and on attempted eradication of lantana, questionable expenditure on artificial regeneration, replacement of grass by undergrowth on many areas (this being mainly an advantageous result in providing a better soil covering and the establishment, in some areas, of evergreen thicket (an adverse factor in that its presence precludes natural regeneration of valuable deciduous spcies)."

The total volume of timber extracted over about 1,830 acres was 142,000 cubic feet between 1904 and 1923.

183. *Revised working plan for Punachi Working Circle.*—In 1925, Mr. Coode revised the Punachi Working Plan of 1908. This working plan also prescribed selection fellings of valuable species. Sound stems of less than 6 feet girth at breast height were not to be removed and no live tree, sound or otherwise, was to be felled if its removal would create an undue opening of the canopy. The annual yield was estimated approximately and a table of fellings provided. The plan also provided for regeneration operations which were on the lines of the shelterwood system, as will be apparent from the following prescriptions :—

(i) A specified area of 365 acres was to be treated for 15 years under an intensive system cf natural regeneration, coupes being worked annually. The procedure laid down was (*a*) evergreen thicket and undergrowth was to be felled in December, strewn evenly over the area and burnt in February-March, (*b*) thickets of lantana were to be burnt as late as possible every year, (*c*) the roots of all rosewood in the area were to be wounded after the burn, (*d*) reburning in subsequent years and the removal of the overwood were to be done at the discretion of the District Forest Officer, (*e*) fire was to be rigidly excluded after obtaining satisfactory regeneration and (*f*) weeding, climber cutting and cleaning were to be conducted as and when necessary.

(ii) In the area in which Selection fellings were to be carried out, (*a*) the roots of all rosewood trees marked for felling were to be wounded, (*b*) regeneration was to be tended and creeper cutting done in the year following felling and (*c*) all dense thickets of lantana were to be burnt as late as possible.

(iii) Artificial regeneration was considered to be too costly and was not therefore prescribed, but natural regeneration was to be secured or supplemented.

184. *Results of working*, 1934.—Between 1925 and 1934, an area of 1,091 acres (compartments 2, 5, 6-a, 7, 8, 9, 11, 19 and 20) was exploited and 124,745 cubic feet of timber were removed as against an estimated yield of 27,650 cubic feet. It is therefore apparent that, after condemning the working plan of 1908 in the manner stated in paragraph 182 above, the new working plan resulted in removing nearly the same quantity of timber in about half the period from less than two-thirds of the area! Over-exploitation had

persisted and grass and lantana were more firmly established than before. The late burning of lantana was discontinued as it failed to destroy the weed. The root wounding of rosewood had produced some suckers, the dibbling of teak, *Pterocarpus marsupium* and *Dalbergia latifolia* in gaps had been fairly successful but the task of promoting them in a sea of lantana was found costly and difficult. Nor were the financial results of the working plan satisfactory. Between 1926 and 1934, the total loss sustained over the operations was about Rs. 19,500.

185. *Prescriptions of* 1920 *for the Fuel Working Circle.*—In the year 1920 Mr. E. M. Crothers prepared a " Summary of Prescriptions " for the working of Pothamadai Gudaravalli, Ayerangal, Pachathanni and Kottur fuel series. The series were reconstituted and the simple coppice system was substituted for " coppice with standards " since the demand for timber could be met from the Mount Stuart forests. The rotation was thirty-five years.

186. *The Udumalpet Fuel Areas.*—The working plan of 1902 was revised by Mr. Habibullah in 1919. He reconstituted the Amaravathi, Kamanuthu and Dhali felling series, over an area of 7,549 acres. The simple coppice system on a rotation of thirty-five years was adopted. A cleaning was to follow the felling in the succeeding year and prickly pear was to be eradicated. In each felling series, six bags of seeds of fuel species were to be broadcast free of cost. The whole area was to be closed to grazing. The scheme of coupes prescribed under this plan was worked up to 1934.

187. *The Pollachi Fuel Working Plan of* 1923.—Mr. Dyson drew up a working plan in 1923 for regularizing fuel working in the Pollachi range. The simple coppice system on a thirty-five year rotation was continued. During the year following felling, a weeding was to be carried out in each coupe during which all lantana was to be pulled out, and coppice shoots were to be cleaned and climbers cut. In 1932, as a deviation to the above working plan, the Keerapadi and Nallar fuel felling series were added to the Fuel Working Circle, increasing its area to 7,013 acres, and all tending operations were deleted This working plan was in operation in 1934 in the Pollachi range.

188. *Evergreen forests.*—Between 1926 and 1933, an area of 3,750 acres of the Kalar valley sholas was exploited for *Mesua* sleepers. On the whole 79,298 broad gauge and 18,221 metre gauge sleepers were obtained and delivered at Pollachi for an expenditure of Rs. 3,88,463. The sale-proceeds amounted to Rs. 7,58,199, thus showing a profit of Rs. 3,69,736, or about Rs. 4–3–0 per broad gauge sleeper unit. The other timber sold (*Palaquium, calophyllum, Dysoxylum, Cedrela*) amounted to 10,366 cubic feet and showed a small profit. No artificial regeneration or cultural operations were attempted since the area was expected to be taken up for cinchona plantations.

189. *Bamboos.*—Mr. Dyson's Working Plan of 1923 for Pollachi range states " bamboos have been worked on a five-year rotation in three bamboo felling series. Coupes are sold annually to contractors, in auction." This working plan divided the Pollachi range into six bamboo felling series, each series containing 3 coupes to be worked on a three-year cycle :—

(1) Pothamadai.	(4) Pachathanni.
(2) Ayerangal Upper.	(5) Villoni.
(3) Ayerangal Lower.	(6) Thadaganachi.

Bamboos in Udumalpet range were put up for sale from 1916 on a three-year felling cycle with some success.

190. *Minor produce.*—In 1922–23, the lease amount for minor produce with the Anamalai Planters' Association was reduced from Rs. 330 to Rs. 280 a year and the portion of Pollachi range previously included was taken away. Subsequently, on an audit objection, the area leased to planters was restricted to a range of 2 miles from plantation limits. The area excluded was auctioned in 1928 and 1929 for Rs. 300 and Rs. 700 respectively. In 1930, the right to collect cardamoms from Punachi and Ulandi ranges was given to the Anamalai Planters' Association for Rs. 750 and other minor produce within the two mile range for Rs. 50, while the excluded area fetched Rs. 310 in auction. In 1931–32, all the produce from Punachi range was sold to the association for Rs. 1,000. The planters did not wish to buy the minor produce in the next year and it was auctioned for Rs. 1,021. In 1933–34, at the intercession of the Collector, the right to collect the produce from the Punachi and Ulandi ranges was again given to the association for a period of 12 years at Rs. 1,200 a year.

Elsewhere in the division, except in Tunacadavu range, the right of collection has been sold in auction.

191. *Grazing.*—Mr. Dyson's Working Plan of 1923 prescribed that, with the exception of fuel coupes less than five years old, the forest should remain open to grazing since closure would spread prickly-pear more rapidly. No limit to the number of cattle to be admitted was considered necessary. In Udumalpet range elaborate restrictions on the number of cattle to be admitted were enforced from time to time under various schemes constituting grazing blocks, and extensive areas were closed to grazing. These schemes are now obsolete consequent on Government declaring in G.O. No. 595, Development, dated 29th April 1932, that cattle may be grazed on a single permit anywhere in a forest division.

192. *Fire-protection.*—The Udumalpet Range Working Plan of 1919 prescribed the fire protection of fuel coupes for ten years after felling by engaging patrols. Boundaries of enclosures and temples and rights of way were to be fire traced. Mr. Dyson's Working Plan of 1923 considered that fires did little damage in Pollachi range so that no protective work was prescribed. Fire lines were maintained in the Punachi Working Circle and over Rs. 300 were spent every year on fire protection.

I. MOUNT STUART FORESTS.

D. 1931 TO 1940.

Mr. Laurie's Working Plan (1931–32 to 1940–41).

193. *General.*—Mr. Laurie's Working Plan covered an area of 35,033 acres, comprising Mount Stuart, Tekkadi, Ulandi and Palakadavu blocks. The whole area was divided into 102 compartments. A complete enumeration of the workable deciduous forest in the Mount Stuart, Tekkadi and Ulandi blocks, combined with its detailed topographical survey on a scale of 12 inches to the mile, was carried out between 1927 and 1930. Volume outturn tables were compiled from the outturn of past fellings and the total volume of timber per unit of an acre and a half rectangle was posted on a " cover map." A " suitability map " showing areas fit for planting with teak was also prepared. An abstract of the enumeration figures for the 80 compartments in the Mount Stuart and Tekkadi blocks was appended. The Ulandi block was completely enumerated but, for the Palakadavu block, only a rough stockmap was made on the 4-inch scale map and enumerations were conducted in sample strips over 17·2 per cent of the area. The Karianshola was not enumerated.

194. *Working Circles.*—Mr. Laurie prescribed five working circles—the clearfelling, the selection felling, the karianshola, the bamboo and the minor forest produce working circles.

The Clearfelling Working Circles.

195. *Constitution.*—The Clearfelling Working Circle extended over 8,689 acres in the Mount Stuart and Tekkadi blocks, inclusive of 1,857 acres of plantations formed prior to the commencement of the plan (the Mount Stuart Felling Series) and all areas in the Ulandi and Palakadavu blocks which would be clearfelled and planted under the plan (the Ulandi felling series).

196. *Mount Stuart Series—General.*—The rotation was fixed at a hundred years which gave an annual regeneration area of 87 acres. The annual yield was fixed by Von Mantol's formula based on the results of a complete enumeration. The difference between the actual yield from the regeneration area and the calculated annual yield was to be made up by subsidiary fellings in areas not coming up for clearfelling within the next period of 25 years, all saleable timber over 7½ feet in girth being removed over a sequence of areas prescribed until the required outturn was obtained.

197. *Mount Stuart Series—Regeneration prescribed.*—Teak was to be the primary species for regeneration, the chief auxiliary species being *Dalbergia latifolia* and *Pterocarpus marsupium*. The espacement was to be 4½ feet by 4½ feet but since stump planting was prescribed it was expected that an espacement of 6 feet by 6 feet would be found sufficient and this point was to be decided by experience. The auxiliary species were to be introduced by sowing in the same patch as the teak.

198. *Mount Stuart Series—Thinnings prescribed.*—It was expected that thinnings would be required in about the sixth, twelfth, eighteenth, thirtieth and fiftieth years after formation. Prescriptions were drawn up to this schedule but the District Forest Officer was at liberty to alter the time if he considered it necessary.

199. *Ulandi Series—General.*—An area of at least 50 acres was to be clearfelled and planted with teak stumps at an espacement of 6 feet by 6 feet, in areas suitable for the purpose as marked on the management map. The work was to be done by contractors, in combination with ponam crops, but, if such opportunities did not occur, departmental regeneration was to be carried out. Thinnings were expected to be required in the fifth, eleventh, seventeenth, twenty-ninth and forty-ninth years after formation.

200. *Mount Stuart Series—Main fellings executed.*—During the years 1931 to 1934, the annual areas clearfelled varied considerably from the prescribed extent, but the total area felled was 347 acres against the prescribed area of 319 acres. From 1936 to 1938, the felled areas agreed with the annual prescribed extent of 87 acres. The yield obtained is compared with the estimated yield in the subjoined statement :—

Year.	Area prescribed in acres.	Area felled in acres.	Yield in cubic feet. Species.	Estimated.	Actual.
1931–34	319	347	Teak	162,200	126,366
			Rosewood	7,370	7,536
			Other species	122,200	50,719
1935	87	87	Teak	30,800	50,433
			Rosewood	8,600	2,253
			Other species	33,300	13,011
1936	87	88	Teak	22,500	17,274
			Rosewood	1,750	525
			Other species	32,750	10,532
1937	87	87	Teak	33,470	23,359
			Rosewood	9,370	3,402
			Other species	36,160	18,924
1938	87	87	Teak	41,200	34,432
			Rosewood	1,800	605
			Other species	31,200	10,128
1939	87	183	Teak	..	67,361
	plus acres swamp	6	Rosewood	..	3,730
			Other species	..	45,221

It will be observed that the actual yields are generally considerably lower than the estimated yields, particularly so in the case of species other than teak. The death and disappearance of trees due to intense fires, the practice of square dressing of timber now prevailing for all species (except rosewood and *Lagerstroemia*) as against the round logs for which the volume outturn tables were prepared, the limited market for *Terminalia tomentosa*, the doubtful accuracy of the volume tables emphasized by Mr. Laurie, and the fact that the conversion of miscellaneous species does not usually go down to trees below a girth of four feet while Mr. Laurie had estimated them to go down to three feet, account for the discrepancies noticed.

201. *Mount Stuart Series—Subsidiary felling executed.*—The subsidiary fellings were held in abeyance till 1936–37 since the sale depot was overstocked with timber from clear-fellings and selection fellings as a result of a slump in the Pollachi timber market. Subsidiary fellings were executed as shown in the subjoined statement which gives the actual outturn only since areas felled did not correspond with the areas prescribed :—

Year.	Compartments exploited.	Outturn in cubic feet. Species.	Actual.
1936–37	.. 26 (*a*) and 29 (*a*), (*b*), (*c*) and (*d*) ..	Teak	36,911
		Rosewood	557
		Others	6,683
1937–38	.. 24 (*a*) and 25 (*a*)	Teak	35,1[illegible]5
		Rosewood	169
		Others	12,845
1938–39	.. 1 (*a*), 2 (*a*) and 22 (*a*)	Teak	39,976
		Rosewood	1,620
		Others	14,679
1939–40	.. 6 and 7 (part)	Teak	11,041
		Rosewood	22,582
		Others	1,758

202. *Mount Stuart Series—Regeneration carried out.*—As anticipated by the working plan, stump planting of teak at an espacement of 6 feet by 6 feet was adopted as the standard practice as elsewhere in the province. The auxiliary species were introduced in the same patch as the teak until 1939, after which their introduction with the teak was discontinued under the orders of the Chief Conservator. The introduction of auxiliary species in quincunx was tried experimentally but was given up owing to the difficulty that is likely to arise in mechanical thinnings and in the regulation of the mixture. The areas actually regenerated are shown below as compared with the areas prescribed :—

Year.	Area prescribed. in acres.	Area done in acres.	Cost of formation per acre to the end of third year.	Remarks.
1932	81·0	92·3	70·41	
1933	78·5	48·8	55·70	
1934	79·7	92·0	48·50	
1935	79·8	91·0	47·20	
1936	87.0	87·0	47·70	
1937	87·0	88·0	39.15	
1938	87·0	87·0	43·01	For 2 years.
1939	87·0	87·0	26·93	For 1 year.
1940	87·0	183·0	..	

203. *Mount Stuart Series—Regeneration costs.*—The cost of the different items of regeneration operations, per acre, has been as shown below :—

Items	Cost in rupees and decimals in							
	1932.	1933.	1934.	1935.	1936.	1937.	1938.	1939.
Cutting and burning slash ..	13·33	7·00	7·46	5·95	5·67	3·69	6·22	6·18
Reburning	7·48	3·59	4·48	4·77	6·69	4·48	8·38	4·88
Staking	2·41	1 21	2·24	1·07	1·88	2·06	1·59	1·66
Nursery cost	5·99	3·96	4·44	4·68	5·42	3·92	4·62	4·38
Planting	4·83	5·07	3·14	2·88	2·62	2·41	2·14	2·26
Weeding, 1st year	16·64	13·84	16·39	15·30	15·14	14 77	14·56	11·27
,, Second year ..	10·61	10·06	4·92	5·33	5·20	5·11	4·06	..
,, Third year	4·49	3·73	0·88	1.54	1·92	1·23	..	..
Replacing casualties	0·80	3·79	0·13	1·32	0·87	0·59	0·87	0·14
Other miscellaneous costs, such as construction of paths, sheds, etc.	3·83	3·45	4·42	4·36	2·29	0·89	0·57	0·53
Total ..	**70·41**	**55·70**	**48·50**	**47·20**	**47·70**	**39·15**	**43·01**	**31·91**

204. *Mount Stuart Series—Ponam regeneration.*—In 1928, the then Range Officer persuaded a friend of his, a Travancore landowner, to take up 30 acres for ponam regeneration. The south-west monsoon that year was poor, and the rainfall badly distributed with the result that both teak and field crop (paddy) failed. In the year 1930, 15 acres of the regeneration area were allotted to malasars for ponam regeneration and 5 acres to kadirs. The result was again reported to be a complete failure and the Forest department, in consequence, did not repeat this in Mount Stuart for a long time afterwards. Considering the success achieved by ponam regeneration in other divisions (e.g., the Wynaad) 20 acres were attempted at Mount Stuart in 1939, with success. An area of about a hundred acres is being attempted to be ponam regenerated in 1940, out of a total regeneration area of 180 acres; there is little doubt that it will be successful.

205. *Mount Stuart Series—Thinnings carried out.*—Thinnings in the Mount Stuart plantations were carried out as shown below :—

Year of plantation.	Year of thinning.	Thinning.	Outturn.
(1)	(2)	(3)	(4)
	1931–32	Nil	..
R.A. 1926 ..	1932–33	1st	48, 159 poles.
R.A. 1927 ..	1933–34	1st	8,725 ,,
R.A. 1921 ..	,,	2nd	5,320 ,,
R.A. 1928 ..	1934–35	1st	..
R.A. 1922 ..	,,	2nd	..
R.A. 1916 ..	,,	3rd	..
R.A. 1925 ..	,,	Rethinning after 1st thinning.	..
R.A. 1921 ..	,,	,, 2nd thinning.	..
R.A. 1929 ..	1935–36	1st	1,500 marketable poles.
R.A. 1923 ..	,,	2nd	6,625 ,,
R.A. 1930 ..	1936–37	1st	48,255 poles.
R.A. 1924 ..	,,	2nd	146,780 teak and 19,405 miscellaneous poles of which 12,260 teak poles were sold at Re. 0–1–6.
R.A. 1923 ..	,,	2nd	About 30 acres left out in 1935–36 yielded. Teak 9,160 poles. Miscellaneous 2,196 poles.
R.A. 1931 ..	1937–38	1st	Teak 69,270 poles. Miscellaneous 215 poles.
R.A. 1925 ..	,,	2nd	Teak 59,756 poles. Miscellaneous 590 poles.
R.A. 1919 ..	,,	3rd	Teak 10,600 poles. Miscellaneous 6,350 poles.
R.A. 1932 ..	1938–39	1st	Teak and Miscellaneous 17,655 poles.
R.A. 1926 ..	,,	2nd	Teak and Miscellaneous 65, 340, poles,
R.A. 1933 ..	1939–40	1st	} Mechanical thinning of removing alternate rows. Yield 1933 20,000 poles.
R.A. 1934 ..	,,	1st	} 1934 49,200 ,,
R.A. 1927 ..	,,	2nd	Teak poles 9,338.
R.A. 1921 ..	,,	3rd	,, 3,161.
R.A. 1922 ..	,,	3rd	Yield 28,700 teak poles.

206. *Ulandi Series.*—The conversion of areas into teak plantations was done by the contractor who purchased the timber from the selection coupes of the range. Regeneration was combined with ponam, hill paddy being the agricultural crop. The contractor was

compensated for the work done since it was found that he had suffered losses. From 1935 the regeneration was done departmentally since the contractor's work was not satisfactory. The following areas were regenerated :—

Year.	Area regenerated acres.	Cost of formation per acre.	Remarks.
		RS.	
1932	58·4	48·3	Compensation paid to contractor. Tending in 1934 by department.
1933	52·5	34·1	Compensation paid. Tending by department.
1934	52·4	30·1	,,
1935	55·6	49·3	Departmental work. Tending.
1936	55.0	50·0	,,
1937	50·2	39·9	Departmental.
1938	55·5	37·8	,,
1939	56·0	36·2	,,

Regeneration work in the Ulandi Series was stopped in 1938 since it was decided to club this series with the Mount Stuart Series.

207. *Thinnings carried out in Ulandi Series.*—The plantations were thinned as follows but the outturn could not be sold :—

Year of plantation.	Year of thinning.
1932	1938–39. Rethinned in 1939–40.
1933	1939–40.
1934	,,

The Selection Working Circle.

208. *Constitution.*—The total area of the Selection Working Circle was 19,760 acres, divided into the Mount Stuart Felling Series of 7,246·23 acres, lying in the Mount Stuart and Tekkadi blocks and the Ulandi felling series of 12,513 acres in the Ulandi and Palakadavu blocks.

209. *Mount Stuart Series—General prescriptions.*—The annual yield was calculated according to a modified Von Mantel's formula and based on the results of complete enumeration of the growing stock over 3 feet in girth, and a rotation of 160 years estimated as required to grow a teak tree in the natural forest to the exploitable girth of 6½ feet at breast height. On a felling cycle of 40 years, the calculated average annual yield could be obtained by felling all saleable trees of and over a girth limit of 7½ feet. The girth limit for felling was therefore fixed at 7½ feet and coupes were marked on the map to give yields approximately equal to the calculated annual yield. All trees of saleable species of and above a breast height girth of 7½ feet, over bark, were therefore to be exploited from within the coupes marked on the map.

210. *Mount Stuart Series—Regeneration prescribed.*—Natural regeneration was considered insufficient for the preservation or improvement of the forest so that artificial regeneration of the gaps created in each year's selection coupe was prescribed as an experimental measure, and the position was to be reviewed after four years. The species for regeneration were to be teak, *Dalbergia latifolia* and *Pterocarpus marsupium*.

211. *Ulandi Series—General.*—Owing to difficulty of access, the Ulandi Series had not been worked regularly in the past and the growing stock was found insufficient to allow of economic working for more than about ten years. The best method of working this forest was considered to be through the agency of contractors who would rapidly extract the timber along the Cochin Forest Tramway which was not sure of functioning in perpetuity. As a result of the abnormally large quantity of overmature timber and the deficiency of lower sizes, the girth limit for the first felling cycle was fixed at 7½ feet. Teak and *Dalbergia latifolia* were the only two species which could be profitably extracted via the Cochin Tramway, but other superior species were also to be extracted if it could be done without incurring a loss.

212. *Ulandi Series—Regeneration prescribed.*—All gaps resulting from selection fellings or due to other causes were to be regenerated artificially with teak, *Dalbergia latifolia* and *Pterocarpus marsupium*, in the selection coupe of the year. In addition, at least 50 acres were to be clearfelled and regenerated with teak, mainly, in suitable places, such areas being transferred to the Ulandi Series of the Clearfelling Working Circle as soon as they were clearfelled.

213. *Mount Stuart Series—Fellings executed.*—No selection fellings were carried out in the Mount Stuart felling series during the years 1931–32 and 1932–33.

The subjoined statement shows the coupes felled and the estimated and actual outturn :—

Year.	Coupe and compartment felled.	Species.	Outturn. Estimated.	Outturn. Actual.
			C. FT.	C. FT.
1933–34 .. 1934–35 ..	I (part) compartments 53 b and c and 75 c. I (part) compartments 37 d, 40 b, 52 b and 53 d.	Teak	9,623	20,960
		Rosewood	2,954	3,652
		Other species	19,525	12,897
1935–36 ..	II compartments 25 d, 25 e (part), 26 b, c, d, 29 e, f and 38 b.	Teak	10,896	13,132
		Rosewood	1,380	1,764
		Other species	19,724	6,353
1936–37 ..	III compartments 24 c, d, e, f, 25, e (part), 25 f, 31 c, d, and 32 b.	Teak	13,975	13,998
		Rosewood	1,777	1,183
		Other species	16,096	3,281
1937–38 ..	IV compartments 22 b, c, 28 c, d, e and f.	Teak	8,656	7,486
		Rosewood	1,468	1,180
		Other species	22,449	6,299
1938–39 ..	V compartments 1 b, c, 2 b, 3 (part).	Teak	7,230	11,265
		Rosewood	581	787
		Other species	10,153	9,152
1939–40 ..	VI and VII compartments 3 (part), 4 a, 5 a (part), 6 b (part), c.	Teak	19,986	22,390
		Rosewood	1,031	1,345
		Other species	43,121	13,283

214. *Ulandi Series—Fellings executed.*—In July 1931, a contract for the purchase of timber from the Ulandi valley was signed by Mr. John Kuruvilla for a period of five years. Under the terms of the agreement, a minimum of lakh of cubic feet in log per annum was to be extracted and paid for by the contractor from the clearfelling and selection areas of the Ulandi Series. The logs were to be measured at stump site and valued as follows :—

Species.	Girth.	Rate per C. FT. RS. A.
Teak	Below 4 feet	0 5
Do.	4 feet— 5 feet	0 8
Do.	5 feet and over	0 12
Rosewood	Below 4 feet	0 5
Do.	4 feet—5 feet	0 6
Do.	5 feet—6 feet	0 8
Do.	6 feet—8 feet	1 0
Do.	8 feet—10 feet	1 4
Do.	10 feet and over	1 12
Hopea	5 feet and over	0 8
Other species	Below 54 inches	0 1
Do.	Over 54 inches	0 2

The contractor was also to carry out regeneration of teak over not less than 50 acres, every year, in combination with field crops, teak stumps to be supplied free by the department and a compensation of Rs. 50 per acre of established plantation, less nursery costs, was to be paid to him if the paddy crop failed.

Owing to the inaccessibility of the trees marked for felling in 1931–32 difficulty was experienced in removing timber in the log, and in consequence payment in lump-sum for the trees still standing was arranged for during 1932–33 on the basis of 70 per cent of the yield as estimated at the time of marking. The volumes as estimated for in enumerations were to be multiplied by 0·7 and paid for at 12 annas a cubic foot for teak, 14 annas for rosewood, 8 annas for *Hopea* and 1 anna for other species. In 1933–34 a form factor of 0·60 was adopted in the agreement, but for 1934–35 it was increased to 0·65.

The agreement was renewed again in July 1935 for one year on similar terms. The trees for felling were to be marked by an Officer of the Forest department and their girths at breast height were to be measured *over bark*, the workable bole estimated by eye and the volume calculated according to the quarter-girth formula reduced by the application of a form factor of 0·65. Teak and rosewood were to be paid for at 9 annas a cubic foot. *Hopea* at 8 annas and other species at one anna. Subsequent removals were made on similar terms up to the 9th of July 1940, by which time all trees marked for felling in accordance with the working plan had been felled and removed. A request from Mr. Kuruvilla for a further extension of the contract for one year had to be turned down since all teak and rosewood exploitable under the working plan had been exploited and it was not desirable to remove any more trees from areas already worked over, since the canopy had become very open as a result of the seeding and death of large masses of bamboos.

215. *Quantities removed and revenue realized.*—The quantities removed by the contractor year after year and the revenue realized from him are set forth below :—

Year.	Timber extracted. Species.	Volume.	Revenue realized.
		C. FT.	RS.
1931–32	Teak	54,795	40,213
	Rosewood	1,738	1,493
	Other species	5,034	629
	Top ends	..	1,000
	Total	61,567	43,335
1932–33	Teak	1,10,824	62,339
	Rosewood	10,292	5,789
	Hopea	1,721	860
	Total	1,22,837	68,988
1933–34	Teak	65,721	34,882
	Rosewood	35,077	18,910
	Other species	1,479	92
	Total	1,02,277	53,884
1934–35	Teak	71,511	40,225
	Rosewood	43,047	24,214
	Hopea	4,237	2,119
	Other species	6,171	386
	Total	1,24,966	66,944
1935–36	Teak	60,294	33,915
	Rosewood	31,544	17,744
	Other species	4,038	252
	Total	95,876	51,911
1936–37	Teak	35,715	21,049
	Rosewood	37,421	20,090
	Other species	19,003	1,188
	Total	92,139	42,327
1937–38	Teak	57,314	32,239
	Rosewood	27,304	15,359
	Total	84,618	47,598
1938–39	Teak	25,562	14,379
	Rosewood	23,576	13,261
	Other species	14,145	884
	Total	63,283	28,524
1939–40	Teak	22,485	12,648
	Rosewood	15,798	8,886
	Total	38,283	21,534
	Grand total—		
	Teak	5,04,185	4,25,045
	Rosewood	2,35,797	
	Other species	55,828	

216. *Mount Stuart Felling Series—Gap regeneration.*—The gap regeneration experiments of 1931, 1932 and 1933 were confined to blanks caused by the death of bamboo clumps below the Mount Stuart Forest rest-house since there were no selection fellings in 1931–32 and 1932–33. In 1934, however, gaps in the selection coupe of 1933–34 (Coupe I) were taken up for regeneration with teak, rosewood and vengai. In 1935 and 1936 gaps were regenerated in Coupes I and II and an espacement of 3 feet by 3 feet was also tried to see if tending could be given up sooner in such gaps. The results are given below :—

Year.	Number of gaps planted.	Year.	Number of gaps planted.
1931	56	1934	102
1932	50	1935	100
1933	30	1936	160

The total cost per acre of ground actually covered by the gaps varied from Rs. 35 to Rs. 117 in the year of planting and from Rs. 43 to Rs. 126 at the end of three years. Gap regeneration was given up in 1937 for the following reasons :—

(*a*) It costs more per acre of ground regenerated than regular plantations.
(*b*) The proportion of periphery where nothing grows is high.
(*c*) Continued tending is necessary but exposes the plants to danger from game.

217. *Tending natural teak regeneration.*—A severe and extensive fire passed through the Mount Stuart forests in March 1935. The bamboo having died between 1926 and 1930 and the fire was fierce and many trees were killed. The general appearance of the forest changed in many places from a dense crop to an open area with trees spaced wide apart, and an undergrowth of lantana, *Helicteres*, etc., with a great deal of natural regeneration of teak, mainly fire coppice from suppressed seedlings. This natural regeneration was tended in 1936 over Coupes II, III and IV (about 400 acres) at a cost of Rs. 89. In 1937, this work was repeated over 1,680 acres at a cost of Rs. 254.

218. *Ulandi Series—Gap regeneration.*—Gaps were prepared in 1931 and 102 gaps were regenerated in 1932 in areas exploited in 1931. Gaps were regenerated every year from 1933 to 1937 after which they were given up for the reasons given for the Mount Stuart Series. The gaps regenerated from 1932 to 1934 were tended annually up to and including 1935, the 1935 gaps were tended up to 1936 and the 1936 gaps were tended in 1937. The following statement exhibits the numbers of gaps regenerated :—

Year.	Number of gaps.	Year.	Number of gaps.
1932	102	1935	90
1933	132	1936	210
1934	144	1937	150

The total cost per acre of ground actually covered varied from Rs. 21 to Rs. 46 in the year of planting and from Rs. 46 to Rs. 52 at the end of three years.

In 1939, instead of regenerating gaps caused by selection fellings, clumps of dead bamboos were burnt all along the Anaigundi-Palakadavu bridle-path and the resulting patches were planted with teak at an espacement of 4 feet by 4 feet. About 40 patches were treated, the areas of the patches being about quarter of an acre each and totalling about 12 acres.

The Karianshola Working Circle.

219. *Constitution.*—The Karianshola Working Circle covered the whole of the evergreen forest of that name extending over 2,060 acres.

220. *General prescriptions.*—The area was to be worked primarily as a protective forest, so that very light selection fellings of saleable species such as *Mesua ferrea*, *Hopea parviflora* and *Calophyllum tomentosum* were prescribed, and the minimum girth limits were fixed at 6 feet, 7 feet and 9 feet, respectively, for the species noted above and at 8 feet for all other saleable species. Gaps created by fellings were to be regenerated artificially with *Hopea parviflora*, *Artocarpus hirsuta*, *Acrocarpus fraxinifolius*, *Mesua ferrea*, *Dysoxylum malabaricum* and *Cedrela toona* and existing natural regeneration of *Hopea parviflora* was to be tended. The rotation was fixed arbitrarily at 150 years and the felling cycle at 25 years, the annual coupe therefore averaging 82·4 acres. No more than three trees per acre were to be exploited and no two trees were to be felled within 20 yards of each other.

221. *Regeneration.*—Gaps caused by felling were to be regenerated at an espacement of 4 feet by 4 feet with seeds, seedlings, or stumps of the species mentioned above. Existing natural regeneration of *Hopea parviflora* was to be tended suitably.

222. *Prescriptions carried out.*—The Karianshola Working Circle has not been exploited for timber till now. At the commencement of the working plan there was a glut in the timber market and it was decided not to exploit this working circle for some time. In 1939 it was decided to commence exploitation of the area and trees were accordingly marked in Coupe I and the coupe put up for sale in 1939–40 but found no purchasers. Coupe II was marked and put up for sale in 1940–41 with no better result.

223. *Regeneration.*—There was no gap regeneration since no fellings were executed. *Hopea* regeneration was tended from 1933–34 to 1936–37 after which it was given up under C.C.P. Mis. No. 554, dated 18th November 1937.

The Bamboo Working Circle.

224. *General.*—The bamboos having seeded and died in the Mount Stuart forests, generally, between 1926 and 1930, except for small scattered areas, no series of annual coupes was laid down. For the first five years the whole area of the working circle was to be sold every year after which a working scheme prescribing coupes to be sold in rotation was to be drawn up.

225. *Prescriptions carried out.*—The right to collect bamboos from the whole of the Tunacadavu Range has been sold in auction every year from 1932–33 except in 1937–38 when the price offered was too low. No working scheme prescribing annual coupes to be sold in rotation was drawn up.

The Minor Forest Produce Working Circle.

226. *General prescriptions.*—The whole of the working plan area was covered by the minor forest produce working circle. Departmental collection of all minor forest produce was prescribed with a view to control forest fires and to learn more about this neglected source of revenue. Elephants were to be captured.

227. *Prescriptions carried out.*—Elephants were captured in 1934–35, 1937–38, 1938–39 and 1939–40. The collection of minor forest produce was waived partly because of shortage of local labour and because it would afford better protection against fires and an amendment to the working plan was issued accordingly. Honey and wax are being collected departmentally, however, from 1938–39.

Miscellaneous Regulations.

228. *Roads, etc.*—A complete road-system within the forest was drawn up, thirty-one miles of which (out of a total of 46 miles) were still to be constructed. The whole system was to be completed before the end of the first felling cycle so that every coupe could be tapped. A bridle path was prescribed from Topslip to Tekkadi through Karianshola. The telephone system was to be extended to Sungum and Tekkadi.

229. *Fire-protection.*—An elaborate system of fire-protection was laid down under which outer boundaries were to be fire-traced to keep out external fires. Internal protection was sought by surrounding plantations by an external line 50 feet wide, and common boundaries between contiguous plantations by lines 12 feet wide. Coupes in which gaps had been regenerated were also to be protected by lines 12 feet wide round them. Fire patrols were to be engaged and look out towers were suggested. The total estimated annual cost of fire-protection was Rs. 2,400.

230. *Roads, etc., constructed.*—The following roads have been constructed up to the end of 1939–40 :—

(1) Ayyaswamimudi Ghat road—5 miles 1 furlong (Dawson road).
(2) Top Tekkadi road, from Ayyaswamimudi, past Tekkadi rest-house to near Padiparai—6 miles.
(2-a) Semmangulipallam branch road—2 miles.
(3) Sichalipallam road as far as causeway over Tunacadavu river—7 miles 1 furlong.
(4) From Sungam towards Tellikal—4 miles.
(4-a) From Sungam branch road—½ mile.
(5) Topslip-Tekkadi bridlepath.
(6) Anaigundi-Palakadavu bridlepath.

The telephone has been extended to Tekkadi and Palakadavu.

231. *Fire-protection as carried out.*—The system of fire-protection laid down by the working plan was carried out in the main for the first three or four years, except that a smaller number of fire patrols were employed and that no look out towers were built. In the hot weather of 1935, fires swept the entire forest causing heavy damage to standing growth owing to large masses of dry bamboos. Most of the plantations were also overrun but the damage to them was not serious owing to the absence of dead bamboos. After this fire, the line along the Vengolimalai ridge was omitted from fire tracing, the line from the Topslip Ghat road to Umayamalai was stopped at the sheet rock below Kolumbumalai, and selection coupes were removed from protection consequent on the stoppage of gap regeneration. Plantations over two years old were also not protected. The total expenditure on fire-protection sanctioned in 1939–40 was Rs. 1,330.

II. OTHER AREAS.

D. 1935 TO 1940.

Mr. Sarma's Working Plan from 1935 to 1936.

232. *General.*—Mr. Sarma's working plan was prepared for such of the forests of the Coimbatore South division as were not covered by Mr. Laurie's plan for the Mount Stuart forests. The area dealt with was 344·6 square miles.

233. *Working Circles.*—The following eight working circles were constituted :—

(1) A selection working circle for the most accessible of the evergreen forests.
(2) A plantation working circle for the deciduous timber forests of the Punachi.
(3) A clearfelling fuel working circle for the forests on the outer slopes.
(4) A bamboo working circle.
(5) A sandal propagation working circle.
(6) A minor forest produce working circle.
(7) A grazing working circle.
(8) A protection working circle.

The Selection Working Circle.

234. *Constitution.*—The selection working circle comprised the best of the most accessible sholas of the Kalar valley, covering an area of 4,885 acres and forming the Kalar felling series. The area was set apart by Government for the formation of cinchona plantations, but it was not expected that it would be taken up for such planting at any early date.

235. *General prescriptions.*—The more important species were enumerated over a third of the area, in strips two chains wide, omitting adjoining strips four chains wide. Trees down to 3 feet in breast height girth were counted. The area was to be worked on a selection system under which saleable trees of and above a minimum breast height girth of 7 feet were to be exploited in a felling cycle of ten years with a view to harvesting mature trees rapidly. *Mesua ferrea*, for railway sleepers, was the only species which could be exploited at a profit, with certainty, but other species could be exploited if saleable at a profit. Trees marked for felling should be at least 60 feet apart from each other and no more than four trees may be removed from each acre of the coupe. Coupes were marked on the map so as to yield approximately equal numbers of railway sleepers.

236. *Regeneration.*—Gaps more than 200 square yards wide which did not contain valuable advance growth or regeneration were to be regenerated artificially at an espacement of 6 feet by 6 feet with valuable species such as *Acrocarpus fraxnifolius*, *Cedrela toona*, *Dysoxylum malabaricum*, *Artocarpus hirsuta*, *Dipterocarpus bourdilloni* and *Gluta travancorica*.

237. *General prescriptions carried out.*—Coupes I to V were worked regularly from 1935–36 to 1939–40, in accordance with the prescriptions. In addition to *Mesua* sleepers, some red cedar scantlings were also sold. Charcoal was manufactured from rejections and topends of *Mesua* in 1939–40 but the operation resulted in loss.

In 1939–40, the Government decided to expand cinchona planting in the Kalar valley and a five-year programme of planting was sanctioned. The areas to be planted in the next five years included Coupes I to V already worked for *Mesua* sleepers under the selection system. It was therefore decided to exploit these coupes once again, this time for all available *Mesua* sleepers, irrespective of any girth limit, and then hand them over to the Cinchona department for clearfelling and planting. Accordingly, Coupes IV and V were exploited again in 1940–41. Part of Coupe VI has also had to be worked to make up the allotted quota.

The outturn of railway sleepers from Coupes I to V is compared with the working plan estimate in the subjoined statement :—

Coupe.	Sleeper yield in B.G. units. Estimated.	Actuals. Passed sleepers.	Remarks.
	RS.	RS.	
I	11,541	8,915	Part of the coupe found unworkable.
II	11,498	10,627	
III	11,957	14,270	
IV	11,736	11,960	
V	12,864	10,027	

238. *Regeneration carried out.*—Regeneration was carried out in 68 gaps of Coupe I in 1936–37. Seeds of *Acrocarpus fraxinifolius*, *Artocarpus hirsuta*, *Cedrela toona* and *Dipterocarpus bourdilloni* were dibbled in June-July. Nursery transplants of *Acrocarpus* and *Artocarpus hirsuta*, six months old, were planted out in October, but they did not survive. An expenditure of Rs. 162 was incurred in sowing, planting and weeding.

In 1937–38, 40 gaps were regenerated in Coupe II with *Acrocarpus*, *Artocarpus hirsuta*, *Dysoxylum* and *Gluta*, stumps being used for the former two species and seeds for the latter. Gaps in Coupe I were tended. An amount of Rs. 124 was spent. In 1938–39, 60 gaps in Coupe III were regenerated, with the species mentioned above and the gaps in Coupes I and II were tended, at a total cost of Rs. 265.

Gap regeneration was discontinued as the results were not encouraging owing to suppression by heavy weed-growth and damage by game.

The Plantation Working Circle.

239. *Constitution.*—The old Punachi working circle, was reconstituted as the plantation working circle. The area was 2,612·6 acres, divided into the 20 compartments as described in the Punachi working plan of 1925. An area of 225 acres was selected as suitable for clearfelling and planting with teak and *Dalbergia latifolia* during the next ten years and called periodic Block I. The rest of the working circle, designated as Periodic Block II, was to be exploited under the selection system.

240. *Prescriptions for Periodic Block I.*—An area of about 25 acres in Periodic Block I was to be clearfelled every year and regenerated with teak, *Dalbergia latifolia* and *Pterocarpus marsupium* in combination with field crops with the co-operation of the local hill tribes. *Artocarpus hirsuta* was to be tried as an experiment. The espacement was to be 6 feet by 6 feet.

241. *Prescriptions for Periodic Block II.*—One compartment was to be exploited annually under selection fellings. Only teak, *Dalbergia latifolia* and *Pterocarpus marsupium* were to be felled and no *sound* tree of *less* than six feet girth at breast height was to be removed. The surface roots of all rosewood (*Dalbergia latifolia*) marked for felling were to be wounded in two concentric circles of about 10 and 20 feet radius in order to induce rootsuckers. A tending of young seedlings and saplings was to be done in the felled area in the year after exploitation. And, as an experimental measure, six gaps were to be regenerated with teak stumps every year for a period of three years and protected by a surrounding belt of *Tephrosia candida*, with a view to see if the belt would keep out the invasion of the gaps by lantana.

242. *Prescriptions carried out in Periodic Block I.*—The areas clearfelled and regenerated with teak are given below :—

Coupe.	Year of formation.	Area regenerated in acres.	Cost of formation per acre. RS.	Remarks.
I	1936	27·0	42·25	For 3 years.
II	1937	22·9	41·56	Do.
III	1938	21·8	37·31	Do.
IV	1939	27·5	23·81	For 2 years.
V	1940	24·0	14·56	For 1 year.

The cost of various items of regeneration operations per acre have ranged as follows :—

Items of work.	Minimum. RS.	Maximum. RS.
Cutting and burning	8·03	13·49
Staking	1·87	3·70
Planting	1·92	6·19
Weeding, 1st year	4·46	8·23

243. *Prescriptions carried out in Periodic Block II.*—Selection fellings were carried out in Periodic Block II as shown below :—

Year.	Compartment number.		Actual yield. C. FT.	Remarks.
1935–36	10	Teak	841	Departmental extraction.
		Vengai	1,336	
		Rosewood	345	
		Total ..	2,552	
1936–37	13	Teak	2,956	Sold standing, form factor 0·75. Eight annas a c. ft.
		Vengai	205	
		Rosewood	489	
		Total ..	3,650	
1937–38	15	Teak	2,573	Sold standing at 6 annas a c. ft., form factor 0·75 for sound and 0·33 for unsound trees.
		Vengai	802	
		Rosewood	1,727	
		Total ..	5,102	
1938–39	16	Teak	5,371	Departmental extraction.
		Vengai	3,407	
		Rosewood	1,409	
		Total ..	10,187	

Climbers were cut at the time of marking and felled areas were tended in the year following exploitation. Rootwounding of rosewood trees was also executed as prescribed. Teak and rosewood raised in gaps between 1926 and 1934 was tended as prescribed. The teak plantations of 1922 to 1924 were thinned in 1938–39. Experimental regeneration of teak under the protection of a belt of *Tephrosia candida* was carried out in 1936, 1937 and 1938.

The Fuel Working Circle.

244. *Constitution.*—The Fuel Working Circle was distributed between the Pollachi and Udumalpet ranges and covered an area of 20,200 acres on the outer hillslopes. There were twelve felling series in all, of which seven were in Pollachi range and five in Udumalpet.

245. *General prescriptions.*—The fuel areas were to be worked on the " Simple coppice " system. A rotation of 30 years was fixed for the five westernmost series as the coppice regrowth was more rapid in them due to heavier annual rainfall. The remaining seven series, to the east, were to be worked on a rotation of forty years. Coupes were to be closed to grazing for ten years inclusive of the year of felling in view of the artificial regeneration prescribed.

246. *Regeneration.*—Natural regeneration by coppice was to be supplemented by " rab " regeneration in strips. The species recommended were *Acacia leucophlœa*, *Acacia ferruginea*, *Albizzia amara*, *Albizzia lebbek*, *Melia indica*, *Zizyphus jujuba*, *Chloroxylon swietenia*, *Sapindus emarginatus*, *Cassia fistula*, *Dolichandrone crispa*, *Gmelina arborea*, *Anogeissus latifolia*, *Hardwickia binata*, *Terminalia chebula*, *Tamarindus indica*, *Anacardium occidentale* and *Cassia siamea*. It was suggested that regeneration by " kumri " or " podu " may be tried experimentally.

247. *General prescriptions carried out.*—In the Udumalpet range the demand for fuel coupes was slack from 1936 to 1939 owing to famine conditions in the Udumalpet and Dharapuram taluks and as a result of disreservation of the Dhali reserve (639·08 acres) and 653 acres of the Anamalai reserve. Low demand can also be attributed to the electrification of cotton mills. With the disappearance of famine conditions even arrear fuel coupes have been sold for 1940–41 in this range. In the Pollachi range the coupes have found sales regularly in the main. Notes on the working of the different felling series are given below :—

(1) *Pothamadai.*—Coupes XV to XIX have been worked in order from 1935–36 to 1939–40. Coupe XX has been sold for 1940–41.

(2) *Keerapadi.*—Coupes IV to VIII have been worked in order from 1935–36 to 1939–40. Coupe IX has been sold for 1940–41.

(3) *Gudaravalli.*—Coupes XV to XIX have been worked regularly from 1935–36 to 1939–40. Coupe XX has been sold or 1940–41.

(4) *Ayerangal.*—Coupes XV to XIX have been worked regularly from 1935–36 to 1939–40. Coupe XX has been sold for 1940–41.

(5) *Pachathanni.*—Coupe VI was worked in 1935–36, Coupe VII in 1937–38 and Coupe VIII in 1938–39. Coupes X and XI have been sold for 1940–41. Coupe IX remains unsold for want of an extraction road.

(6) *Kottur.*—Coupes XV to XIX have been worked in order from 1935–36 to 1939–40. Coupe XX has been sold for 1940–41.

(7) *Nallar.*—Coupes VII to XI were worked in order from 1935–36 to 1939–40. Coupe XII did not find a sale in 1940–41.

(8) *Dhali.*—Coupe XII was worked only 1936–37. No coupes were worked in 1935–36 or after 1936–37 up to 1940. The Dhali reserve of 639·08 acres, consisting of coupes III to V, XXVIII to XXX, part of XXXII and XXXIII to XXXV, was disreserved in 1938 and the growth felled in 1939–40. Coupes XVI and XVII have been sold for 1940–41.

(9) *Kamanuthu.*—Coupes XVI to XVII were worked in 1935–36 and 1936–37, and coupe XVIII in 1938–39. Coupes XIX, XX and XXI have been sold for 1940–41.

(10) *Chinnar.*—Coupes I to IV were worked regularly in 1935–36 to 1938–39. Coupes V and VI have been sold for 1940–41.

(11) *Amaravathi.*—Coupe XVII was worked in 1936–37 and 1938–39. Coupe XVI in 1937–38 and 1938–39 and coupe XIX in 1938–39. Coupe XX did not find a sale in 1939–40 or 1940–41. Coupe XXI has been sold for 1940–41.

(12) *Navalodai.*—Coupe I was worked in 1935–36. Coupes II to VI did not find sale.

248. *Regeneration—rab sowings.*—With exception of the coupes regenerated under " ponam " and mentioned in the next paragraph, rab sowings have been done over the first one or two strips of the coupes of the year in the North-East monsoon of the year of felling and over the remaining strips of the coupes in the south-west monsoon following the completion of felling. The expenditure has averaged a rupee per acre dealt with. Weeding has been done in the year following sowings. The species used were, mainly *Acacia Arabica*, *Acacia Ferruginea*, *Acacia leucophlœa*, *Acacia planifrons*, *Albizzia amara*, *Albizzia lebbek*, *Melia indica*, *Cassia siamea*, Tamarind and teak.

249. *Ponam regeneration.*—Ponam regeneration of fuel coupes appears to have been started in 1935 in the Ayerangal fuel series. Cotton and ragi were the field crops raised. A considerable degree of success was attained so that the coupes in this series have been regenerated every year in the same manner. The system was extended to the Nallar

series in 1937 and to Kamanuthu and Pothamadai in 1938. In the next year, coupes in Pothamadai, Keerapadi and Kottur were leased out *free* for a period of three years (1939 to 1942) for ponam cultivation and regeneration. The demand for such leases soon became keen so that, in 1940, coupes in Ayerangal, Keerapadi and Pothamadai have been leased out for three years for ponam regeneration in return for rents of Rs. 345, Rs. 300 and Rs. 390, respectively. The distance apart of the regenerated lines was 40 feet to start with but has been reduced to 20 feet recently.

The Bamboo Working Circle.

250. *Constitution and working.*—All bamboo areas of the division which could be worked at a profit were included in the Bamboo Working Circle. The area was 63,104 acres and eleven felling series were constituted, six in Pollachi range, one in Punachi range and four in Udumalpet. A felling cycle of three years was adopted and a set of felling rules was drawn up.

251. *Prescriptions carried out.*—The bamboo coupes were auctioned every year as prescribed and have generally been sold at satisfactory prices. It was observed by the writer that the rule prescribing the retention of a minimum of six mature culms in each clump has not been adhered to in some places. For example, in the Villoni series whole clumps have often been nearly clearfelled. Unless this rule is more strictly enforced the bamboo is very likely to disappear from the nearer and more easily accessible localities in a decade or two.

The Sandal Propagation Working Circle.

252. *Constitution.*—An area of about 40,000 acres on the Pundi-Mavadap plateau and the Thalinji-Manjampatti valley was allotted to the Sandal Propagation Working Circle.

253. *Prescriptions.*—Five propagation centres were to be formed every year in each of the ten beats included in the working circle.

254. *Results.*—Propagation centres were formed from 1935 to 1939 as prescribed but the results were unsatisfactory on the whole. Almost from the inception of the scheme the locality was suffering from abnormal drought owing to successive failures of the monsoons, culminating in famine conditions in the adjoining plains.

The Minor Forest Produce Working Circle.

255. *General prescriptions.*—All ivory and horns were to be collected departmentally and sold in auction. The right to collect Gallnuts *Cassia fistula* bark and *Cassia auriculata* bark were each to be auctioned separately. The other produce were to be auctioned together in convenient units. In the Punachi range the produce would continue to be sold to the Anamalai Planters' Association by mutual arrangement based on prices realizable at auction.

256. *Prescriptions carried out.*—The working plan prescriptions have been adhered to in the main. Honey and wax are being collected departmentally, however, from 1938–39 for sale through the Forest Utilization Officer.

The Grazing Working Circle.

257. *Constitution.*—The Grazing Working Circle covered the whole division excluding (1) the whole of the Punachi range except Torakadavu block, compartment 1 of Punachi Working Circle, and 2,924 acres opened for grazing in C.C.P. Mis. No. 58, dated 6th February 1937, (2) the whole of the Tunacadavu range and (3) the Kukkal and Kudarayar blocks transferred from Madura division.

258. *Prescriptions.*—Grazing of cattle (excluding goats), was to be permitted over the whole of the Coimbatore South division (with the exceptions mentioned above and areas temporarily closed) on one permit. Penning would be free but pens were not to be allowed within the Fuel Working Circle or within half a mile of it. Cattle might be penned only in localities approved by the District Forest Officer and incorporated in the annual grazing notifications, new pens requiring the approval of the Conservator. No improvements to watering facilities were considered necessary. Areas extending to 1,000 acres might be closed to grazing by the District Forest Officer if damaged by fires but the closure had to be approved by the Collector within ten days. Fuel coupes were to be closed to grazing for ten years from the year of felling. Compartment 1 of Punachi Working Circle was open to local cattle at Re. 1–4–0 per head but limited to 30 heads of cattle. The Pulayars of Lower Punachi were allowed free grazing for ten heads of cattle.

259. *Prescriptions carried out.*—Grazing fees were reduced by 50 per cent from 1st April 1938 in G.O. Press No. 836, Development, dated 29th March 1938. The fees were reduced further to Re. 0–2–0 a unit from 16th February 1939 to 30th June 1939, temporarily, on account of famine conditions in Dharapuram and Udumalpet taluks. For the same reason, bison areas that were open to grazing for inoculated cattle only were opened for all cattle in G.O. No. 158, Development, dated 19th January 1939. The pens

noted in the working plan were found insufficient and more pens were therefore notified as permissible. Free removal of fodder grass was availed of to a large extent as a result of famine conditions in neighbouring taluks. Watering facilities were improved at Kannimar-uttu and near Manupatti adjoining the Chinnar road. An extent of 2,924 acres in 3 bits was opened to grazing in Punachi range in C.C.P. No. 58, Mis., dated 6th February 1927, to facilitate grazing of estate cattle.

260. *Disabilities noticed.*—There was a general demand for a larger number of pens to be notified. The practice of allowing penning only in three pens at a time and of requiring the endorsement of the Range Officer on the grazing permits for such pens or for changing on to other sets of three pens was reported to be causing hardship to owners and graziers. Inoculation of cattle was resented strongly as causing heavy mortality, abortion and sterility. Improvements to watering facilities were sought in a few places.

SECTION 3.—SPECIAL WORKS OF IMPROVEMENT UNDERTAKEN.

261. *The " Slip."*—Prior to 1850, timber from the Mount Stuart forests was dragged to Topslip, slipped down the ghat (hence the name " Topslip "), thence carted to the Palghat river and floated down to the West Coast. The " slip " was just a dragpath with poles laid across.

262. *Old ghat road.*—Captail Michael constructed a cart-road in 1850, known as Michael's trace, 6½ miles long from Topslip to the Sichalipallam, at a cost of Rs. 4,139; the last mile of this road lies in the Tekkadi leased forest In 1856, he also aligned a ghat road to replace the " slip " which was subsequently constructed by Captain Gosling in 1868, with slight modifications, at a cost of Rs. 4,009. This road was in use for 56 years until it was replaced by the present ghat road in 1924.

263. *The tramway.*—In 1888, Mr. Porter started the construction of the Mount Stuart tramway, which was the only line of extraction within the forest for the next 38 years. The seven miles to Sungam were compleated in 1891. About 1 mile and 7 furlongs of this went down the ghat from Topslip but was removed soon after as the gradients were too steep. The tramway was of a two-foot gauge, 14 lb. rails (per yard) being laid on corrugated metal sleepers. The total capital cost was Rs. 60,087. Innumerable difficulties were encountered in working on account of sharpness of curves and the steepness of the track (1 in 7 against the lead, in places.) Bullocks and elephants were tried for traction but the former were employed ultimately. The rails were found to be too light and soon acquired a ziz-zag shape. The brakes were ineffective on steep gradients and were consequently supplemented by putting grit in the axle boxes or by locking the wheels.

Most of the difficulties mentioned above were mitigated and tramming went on almost continuously till 1926. An investigation in 1904 revealed that the tramway was working at a loss for the thirteen years of its existence : the total loss was shown as Rs. 29,648 on 569,871 cubic feet extracted, the average cost of tramming being Rs. 2–0–5·7 per candy of 12½ cubic feet against a carting rate of Rs. 1–6–0·2.

Subsequent reports emphasized the bad state of the track and difficulties in getting spare parts and rails. In 1919–20, it was in very bad order and it was decided to abandon it in favour of a road scheme.

264. *The Wire ropeway.*—In 1901, Mr. Gass constructed a wire ropeway to convey the material sawn in the Topslip saw mill (vide paragraph 269 below) from the head of the tramway at Topslip, to the foot of the hills so as to relieve the congestion of carting down the ghat road. The total capital cost was Rs. 15,089 and it was designed to transport sawn material only, the maximum load being 800 pounds. The ropeway conveyed some 10,000 cubic feet of sawn material annually. It was unsatisfactory in many respects and ran at a loss of about Rs. 1,100 per annum as compared with carting. The ropeway went out of use in 1909 when the sawmill was closed down.

265. *The Rouse project.*—In 1911, a survey and estimate was made by Mr. Rouse of Messrs. Rouse Bronfield and Company, for a carefully graded tramway to be worked by bullocks, from Sungam to Ayyasamimudi, through the Tekkadi forests. The scheme did not materialize though it was supported by Mr. P. M. Lushington in 1916.

266. *Steam tramway project.*—In 1917–18, Mr. Marshall, the Forest Engineer, got out plans and estimates for a steam tramway projected by Mr. Bright. The scheme was considered fantastic by Mr. P. M. Lushington, criticized adversely by Mr. Tireman and abandoned under the orders of Mr. Cox, the Chief Conservator, as it " would embarrass the whole future finance of the Forest development in the locality."

267. *The new ghat road.*—Mr. Wimbush submitted a report in 1922 in which he was strongly in favour of a good system of roads. Mr. Marshall made the final trace for the new ghat road from Sethumadai to Anaipadi, a distance of 14 miles. The ghat portion was completed in 1924 and the upper bit in 1926. The total cost was Rs. 3,27,987 and the work was carried out by the Forest Engineering branch.

268. *Waterpower saw mill.*—In 1898, Mr. Gass installed a saw mill worked by water-power on the Tunacadavu river below Mount Stuart for the purpose of converting unsaleable logs of species other than teak, though teak was subsequently sawn up at the mill. An investigation in 1903 revealed, however, that the mill was working at a loss. From 1898 to 1903 the total loss was worked out as Rs. 40,969. One of the chief reasons for the loss was the low annual outturn : the average annual outturn was only 9,771 cubic feet. The low outturn was in turn due to the insufficiencent power developed by the mill as a result of grit in the water wearing down continually the jet of the pelten wheel, and shortage of water in the hot weather. The sawing of teak was discontinued in 1904, resulting in even greater loss in working. The dam which supplied water to the mill was swept away by a heavy flood in January 1909 and the mill had perforce to close down in consequence.

269. *Semi-portable saw mill.*—The stocks in Pollachi depot accumulated to 178,410 cubic feet in 1926, many of the logs being over four years old and degrading considerably. In order to clear off this accumulation, a semi-portable saw mill was installed in June 1926 at a cost of Rs. 35,408 and started work in July 1926. The production cost of the mill, including all overheads, was Re. 1–0–5·8 per cubic foot for 1926–27. In 1927–28 the cost of production rose to Rs. 2–1–7·3 per cubic foot. The mill was moved to Topslip in February 1928 at a cost of Rs. 12,704, with a view to cutting up small crooked logs which could not be sold at a profit at Pollcahi. It was soon evident, however, that the mill could not be worked profitably at Topslip unless a better class of logs was supplied. The production cost at Topslip was Rs. 2–4–10·8 per cubic foot. The mill could not show a profit even if the timber supplied were valued at only the cost of extraction, say 6 annas a cubic foot. The conversion per cent was only 34·9 : the low outturn and the consequently high overhead charges, was the chief cause of failure. Also, the mill was underpowered so that the large breakdown circular saw could not keep the re-saws and the bolter fully engaged. The staff suffered much from malaria. The mill was closed down on 31st December 1929.

270. *Water-supply.*—A hydraulic ram was installed in 1911 on the Tunacadavu river to supply the Mount Stuart buildings with water. This broke down in 1927. In 1927–28, a dam was built across one of the main streams in Karianshola to form a reservoir from which pipes were laid on to all the buildings at Topslip. The total cost of the Topslip water system was Rs. 13,812.

271. *Ayyaswamimudi ghat road.*—The Ayyaswamimudi ghat road (Dawson's road) joins the Tekkadi end of the Mount Stuart forests with the plains at Sethumadai. The metalled portion from Sethumadai-Topslip road to Ayyaswamimudi saddle is 5 miles 1 furlong long and was completed in 1939–40 at a capital cost of Rs. 41,603. The ruling gradient is 1 in 15.

272. *Laurie's road system.*—Of the interior roads prescribed by Mr. Laurie, those constructed up to the end of 1939–40 are given in paragraph 230 of section 2 of this chapter.

273. *Telephone line.*—There is a telephone line from Pollachi to Anaipadi, for a distance of 22 miles. The Anamalai-Anaipadi section was erected in 1912–13 by the Telegraph department and handed over to the Forest department in 1926–27 at a book value of Rs. 2,550. The Anamalai-Pollachi section was erected by the Forest Engineering branch in 1926–27 at a cost of Rs. 4,923. Palakadavu and Tekkadi were linked with Topslip in 1933–34 and 1939–40 at a cost of Rs. 925 and Rs. 829, respectively. There are 11 instruments in all, at the following places :—

(1) Pollachi—1 (timber depot).
(2) Anamalai farm—1 (Pollachi Ranger).
(3) Sethumadai—1.
(4) Topslip—2 (Ranger and office).
(5) Anaipadi—1.
(6) Mount Stuart—1.
(7) Tekkadi—1.
(8) Anaigundi—1.
(9) Palakadavu—1.
(10) Vettakaranpudur—1 (doctor).

274. *Anti-malarial measures.*—The Tunacadavu range headquarters at Mount Stuart which had been moved between 1885 and 1890 from their original site near waterfall, were also found to be exceedingly unhealthy in the fever season so that the whole staff used to move down to Sethumadai during the hot weather and return only in June after the monsoon was well established. The Deputy Sanitary Commissioner visited Mount Stuart in 1918 and recommended that the whole settlement may be shifted to Topslip. In 1920 Surgeon-General Giffard visited Mount Stuart with the Chief Conservator and under his orders Doctor Menon of the King Institute, Guindy, conducted a malaria survey of Mount

Stuart in July 1924. On Dr. Menon's report a shift of headquarters to Topslip was decided upon, new quarters, Range office and rest-house were built there, the water-supply scheme described in paragraph 270 above was carried out, and the settlement was occupied early in 1927. The cost of the Topslip settlement including the water-system was Rs. 66,883.

The anti-malarial measures carried out at Topslip consists of clearing the undergrowth all round the settlement to a considerable distance, paving the bottoms of streams with rough stones and placing bags of sawdust soaked in kerosene in all small streams and overflow of pipes, and spraying of Pyrocide 20 inside all dwellings. Recently, from May 1938 onwards, the staff is being taken daily to Anaipadi and back to Topslip in a motor bus at Government expense. The result of all this has been most encouraging and there has been very little malaria in Topslip for the last two years. The motor bus costs the department Rs. 75 per month. Other sums spent on anti-malarial measures total up to an average of Rs. 575 per year for Tunacadavu Range excluding a compounder at Topslip on a monthly pay of Rs. 37. It has been decided to replace the compounder by a forester who has undergone the Sanitary Inspector's training at Madras. The statements given below exhibit the roads buildings, wells, etc., in the Coimbatore South Forest Division, with their capital cost, year of construction and average annual cost of maintenance, for each of the four ranges :—

(*a*) Roads and paths,
(*b*) Buildings,
(*c*) Wells, etc.

(*a*) *Statement of roads and communications in the Coimbatore South Forest Division.*

Serial number and description.	Year of construction.	Length. M. F. CH. FT.	Cost of construction. RS. A. P.	Average annual cost of maintenance. RS. A. P.	Remarks.
			TUNACADAVU RANGE.		
1 The new Mount Stuart road ..	1925, 1927–28 and 1936–37.	15 3 0 0	3,29,887 13 5	5,314 10 0	
2 Topslip-Tellikal road	1927–28, 1929–30 and 1934–36.	9 6 0 0	12,108 5 0	764 12 0	
3 Seechali road including causeway constructed in 1937–38 and Akasapallam bridge constructed in 1938–39.	1928–31 and 1936–39.	7 1 5 0	24,687 0 0	427 3 0	
4 Anaigundi bridle path	1933	8 0 4 4	1,082 0 0	70 2 0	
5 Cycling path from Topslip to Anaipadi.	1927	2 6 0 0	408 9 0	..	
6 Approach road to Mount Stuart rest-house.	1932–33 and 1935–36.	0 4 0 0	675 3 0	37 3 0	
7 Bridle path from Topslip to Tekkadi.	1936–37 ..	5 0 0 0	261 0 0	..	Not being maintained for the past four years.
8 Mankajam-Shemmankulipallam fair weather road.	1937–38 ..	2 0 1 64	2,520 2 0	47 0 0	
9 Top Tekkadi road	1937–38 and 1938–39.	6 1 0 0	8,980 6 0	175 10 0	
			PUNACHI RANGE.		
10 Cinchona lower road	1927–30 ..	4 0 5 47	26,199 14 0	930 15 0	
11 Sirukundru-Cinchona road ..	1930–31 ..	1 3 2 33	Not known.	488 13 0	
12 Aliar cart-track	1920–23 ..	6 5 0 0	7,934 4 10	718 10 0	
13 Suspension bridge across Kalar ..	1930–31 ..	..	947 6 0	418 15 0	
14 Bridle path leading to Kalar suspension bridge.	1930–31 ..	0 4 0 0	Not known.	..	
15 Villoni bridge path (Punachi and Pollachi ranges).	Not known.	12 0 0 0	Do.	..	
16 Branch road from Cinchona low road to suspension bridge.	1930–31 and 1936–38.	0 6 0 0	2,668 10 0	..	Metalling being done in 1940–41.
17 Rope way at Kalar Valley ..	1937–38 ..	..	498 5 3	..	
Purchase of a new central cable in 1939–40.	1939–40 ..	..	165 13 0	..	
			POLLACHI RANGE.		
18 Aliar valley road (Navamulai) ..	1913–14 ..	1 4 0 0	1,499 7 0	..	Not being maintained as not required for departmental purposes.
19 Orlapillu cart-track (Pollachi) ..	Not known.	1 4 0 0	Not known.	..	
20 Gudaravalli Keerapadi cart-track.	Do.	4 0 0 0	Do.	..	
21 Pothamadai cart-track	1926–27	2 0 2 28	2,154 9 0	..	Not being maintained.
22 Adivaram road (Sethumadai old road).	Not known.	0 7 0 0	Not known.	115 10 0	The length outside the R.F. boundary has been handed over to the Revenue department.
23 Sethumadai compound road ..	Do.	0 1 0 0	Do.	..	} Repairs are done by the occupants of the building.
24 Anamalai farm compound road ..	Do.	0 1 5 0	Do.	..	
25 Nalar cart track	1930–31 ..	0 2 0 0	50 0 0	..	Not being maintained now.
26 Pachathanni cart track	1909–11 ..	1 3 0 0	142 7 5	..	Do.
27 Dawson's road	1935–36 to 1938–40.	5 1 1 36	41,603 4 9	* 170 0 0	* Cost of repairs for one year only. Not representative.
28 Pollachi depot compound road ..	..	0 1 2 8	..	43 5 0	
			UDUMALPET RANGE.		
29 Kombu road	1912–13 ..	1 2 0 0	304 15 0	38 8 0	
30 A country cart-track from 1st mile 5th furlong on the Elayamuthur-Manthorai road rounding the old coupes to Manthorai rest-house.	Not known.	About 2 miles.	..	..	This was not constructed by the department nor maintained.
31 Country cart-track from 17th mile 3rd furlong on the Chinnar public road to Sarakkupatti car stand for transport of bamboos.	Do.	About 6 furlongs.	..	..	Do.
32 Country cart-track from 17th mile 7th furlong on the Chinnar public road to Kattalaparaiamman Koil near Kodanthur.	Do.	About 2 miles.	..	..	Do.
33 Kallapuram - Manthorai road (R.F. boundary) to Manthorai R.H.	1914 ..	3 5 0 0	1,442 10 0	108 3 0	
34 Chinnar-Talinji road	1937–38 ..	4 5 0 0	304 0 0	126 3 0	

(b) *Statement of buildings in the Coimbatore South Forest Division.*

Serial number and description. (1)	Year of construction or purchase. (2)	Cost. (3) RS. A. P.	Average annual cost of maintenance. (4) RS. A. P.	Remarks. (5)
		TUNACADAVU RANGE.		
1 Rest-house with kitchen at Topslip	1926, 1928–29 and 1937–38.	14,401 0 0	61 0 0	
2 Servants quarters attached to the rest-house.	1926 ..	2,657 8 0	9 0 0	
3 Motor garage	1926 ..	1,818 5 0	4 0 0	
4 Range Office	1926, 1936–37.	5,172 0 0	23 0 0	
5 Range Officer's quarters	1926, 1928–29 and 1939–40.	8,280 0 0	37 0 0	
6 Servants' quarters attached to No. 5	1926 ..	1,189 3 0	3 0 0	
7 Assistant Rangers' quarters (2 sets)	1926, and 1928–29.	7,185 0 0	32 0 0	
8 Do.	Do.	7,185 0 0	32 0 0	
9 Range clerks' quarters	Do.	7,140 0 0	23 0 0	
10 Foresters quarters' (3 sets)	1926 ..	8,542 0 0	28 0 0	
11 Forest guards' quarters (6 sets)	Do. ..	5,735 0 0	44 0 0	
12 Lineman's quarters	1936–37	215 7 0	8 0 0	
13 Work shop building	1926–27 and 1928–29.	238 0 0	..	No repairs.
14 Bazaar building	1927–28 ..	2,010 0 0	..	Do.
15 Saw mill building	..	3,455 8 0	..	No repairs. Transferred from Forest Engineering Division on 25th January 1930.
16 Stock shed	*1929–30 ..	1,119 8 0	..	* Improvement only. No repairs.
17 Foremans' hut	..	563 8 0	..	No repairs.
18 Foresters' hut	..	563 8 0	..	No repairs. Transferred from Forest Engineering Division on 25th January 1930.
19 Operators' quarters	..	1,127 0 0	..	Do.
20 Coolie lines (15 rooms)	..	1,032 0 0	..	Do.
21 Petrol shed	..	32 8 0	..	Do.
22 Re-t-house at Mount Stuart	1885–86 ..	3,361 0 0 }	23 0 0	
23 Kitchen attached to No. 22	1902 ..	74 4 0 }		
24 Fitters' quarters	1903 ..	2,845 8 0	29 0 0	
25 Range officers' quarters	1890–91 ..	3,250 0 0	..	Dismantled in 1932 in C.C.'s Proceedings Rt. No. 424, dated 24th June 1932.
26 Range office	1905–06 ..	689 10 6	..	Dismantled in 1932 in Conservators No. 1110 of 1932, dated 1st July 1932.
27 Coolie lines	1922–23 ..	6,149 2 11	..	Dismantled in 1934.
28 Foresters quarters at Anaipadi	1899 ..	751 8 0	23 0 0	
29 Store-room	1902–03 ..	845 6 0	7 0 0	
30 Mahout's line	1901–02 ..	1,793 0 0	..	Dismantled in 1932 in Conservators S.O. No. 56 of 1932, dated 13th April 1932.
31 Inspection shed	Not known.	Not known.	28 0 0	
32 Kraal	1916–17 ..	496 0 0	..	No repairs.
33 Kraal at Sungam	1929–30 ..	1,080 0 0	..	Do.
34 Rest house and out-house at Tekkadi	1911–12 ..	3,156 0 0	21 0 0	
35 Ranger's quarters	Do.	980 4 0	24 0 0	
36 Subordinates quarters	Do.	1,547 4 0	37 0 0	
37 Foresters quarters	1938–39 ..	3,562 0 0	36 0 0	Cost of repairs for one year only.
38 Coolie lines	1937–38 ..	2,538 4 0	..	No repairs done after construction.
39 Combined range office and ranger's quarters at Palakadavu.	1932–33 ..	3,420 0 0	12 0 0	
40 Range clerks and poens' quarters	1932–33, and 1935–36.	2,841 0 0	11 0 0	
41 Foresters and Forest guards' quarters ..	1932–33 and 1935–37.	3,230 0 0	12 0 0	
42 Inspection shed	1934–35 ..	285 13 0	50 0 0	
43 Inspection shed at Anaigundi	1937–38 ..	509 3 0	70 0 0	Average for two years only.
		PUNACHI RANGE.		
44 Range officers quarters' at warterfall	1928–29, 1930–32 and 1937–39.	4,550 2 0	78 0 0	
45 Range office and clerks' quarters	1928–29 and 1930–32.	2,431 0 0	23 0 0	Half for office and half for clerk.
46 Foresters' quarters	Do.	1,499 0 0	21 0 0	
47 Peons' quarters	Do.	514 0 0	11 0 0	
48 Range officers' quarters including office at Cinchona.	1928 ..	1,113 0 0	24 0 0	
49 Foresters' quarters	Do. ..	726 0 0	52 0 0	
50 Store and shed	Do. ..	151 0 0	..	
51 Post office building at Attakatti	1918 ..	3,687 0 0	18 0 0	Acquired on 14th April 1932.
52 Line mans quarters	..	614 8 0	2 0 0	Do.
53 Grain store	1909–10 ..	503 0 0	7 0 0	
		POLLACHI RANGE.		
54 Range officers' quarters at Anamalai	1st December 1923.	3,412 0 0	67 0 0	Acquired on 1st December 1923.
55 Range clerks' quarters	Do.	2,544 0 0	21 0 0	Do.
56 Range office and clerks' quarters (combined) ..	Do.	2,647 0 0	16 0 0	Do.
57 Line mans quarters	Do.	1,485 0 0	11 0 0	
58 Sub-lines (5 rooms)	Do.	2,595 0 0	13 0 0	
59 Engine house and gin house	Do.	5,443 0 0	10 0 0	
60 Rest-house	Do.	4,046 0 0	19 0 0	Acquired.
61 Kitchen attached to No. 60	Do.	1,170 0 0	5 0 0	Do.
62 Motor garage attached to No. 60	Do.	531 0 0	3 0 0	
63 Office room at Anamalai village	1901–02 ..	2,050 0 0	..	Handed over to the Revenue Department in 1936 for disposal.
64 Store room at Anamalai village	1909–10 ..	1,689 0 0	..	Do.
65 Overseers quarters at Sethumadai	1920 ..	3,580 0 0	21 0 0	
66 Sub-overseers' quarters	Do. ..	2,554 0 0	21 0 0	
67 Foresters' quarters	1885–86 ..	525 0 0	14 0 0	Written off in conservator's S.O. No. 44 of 1938, dated 30th April 1938.
68 Pollachi range officers quarters	1885–86 ..	798 0 0	16 0 0	A small shed attached to this was written off and dismantled in conservator's S.O. No. 179 of 1932, dated 21st November 1932.
69 Pollachi range subordinates quarters	1893–94 ..	596 0 0	32 0 0	
70 Tunacadavu range officers quarters	1891–92 ..	1,114 0 0	13 0 0	
71 Do. subordinates quarters (3 rooms).	1915 ..	1,228 12 0	24 0 0	
72 Rest-house, kitchen and stable	1885–86 ..	2,304 0 0	29 0 0	
73 Clerks quarters (2 rooms)	1901 ..	236 0 0	..	Dismantled in 1934 in conservator's S.O. No. 139 of 1934.
74 Subordinates line at Tulukkamadai (3 rooms).	1920–21 ..	2,267 0 0	20 0 0	
75 Tanah shed	Do. ..	394 0 0	6 0 0	
76 Tanah shed at Kottur	Do. ..	580 0 0	..	Sold in auction, vide conservator's S.O. No. 75 of 1939, dated 22nd September 1938.
77 Kraal at Ayerangal, Adivaram (double) ..	Do. ..	836 0 0	..	Written off in conservator's S.O. No. 55 of 1938, dated 19th June 1938.

(b) *Statement of buildings in the Coimbatore South Forest Division*—cont.

Serial number and description. (1)	Year of construction or purchase. (2)	Cost. (3) RS. A. P.	Average annual cost of maintenance. (4) RS. A. P.	Remarks. (5)
POLLACHI RANGE—*cont*.				
78 Zinc shed occupied by depot forester ..	1911–12, and 1927–29.	805 11 0	34 0 0	
79 Depot office building	1901–02 ..	779 0 0	13 0 0	
80 Stock shed (zinc)	1926–27 ..	1,729 0 0	5 0 0	
81 Order shed	Do. ..	3,115 0 0	..	No repairs.
82 Saw mill shed	Do. ..	3,569 0 0	..	Do.
83 Dump shed	Do. ..	1,231 0 0	..	Do.
UDUMALPET RANGE.				
84 Range officer's quarters with office and out-house at Udumalpet.	1892 ..	2,800 0 0	161 0 0	Acquired from Judicial Department.
85 Depot-keepers quarters	1907–08 and 1938–39.	1,115 10 0	28 0 0	Leased out to fuel coupe contractor.
86 Depot watchers quarters	1907–08 ..	747 0 0	13 0 0	Do.
87 Tanah shed	1907–08 and 1913.	324 0 0	8 0 0	Rented to one contractor.
88 Subordinates lines at Easalammanthorai (5 rooms).	1921 ..	3,231 0 0	50 0 0	
89 Rest-house with out-house	1890–91 ..	1,323 0 0	97 0 0 (for Nos. 89–91)	
90 Stable attached to No. 89	1894–95 ..	115 0 0		
91 Servants quarters attached to No. 89 ..	1893–94 ..	534 0 0		
92 Subordinates line at Talingi (3 rooms) ..	1913 ..	916 0 0	11 0 0	
93 Do. at Karattur (4 rooms) ..	1930–31 ..	2,248 0 0	29 0 0	
94 Do. at Manupatti (3 rooms) ..	1931 ..	2,289 0 0	42 0 0	
95 Rest-house and additions at Kombu	1895–96 ..	2,150 0 0	14 0 0 (for Nos. 95–96)	One stable and two rooms were dismantled in 1927.
96 Servants quarters 4 (rooms with 3 stables attached to No. 95).	1902–03 ..	453 0 0		
97 Inspection shed and additions at Kallapuram.	1895–96 ..	897 0 0	9 0 0	
98 Rest-house with servants line and stable at Manthorai.	1911–12 ..	2,531 0 0	29 0 0 (for Nos. 98–99)	
99 Kitchen attached to No. 98	1914 ..	247 0 0		

(c) *Statement of wells, tanks, etc., in the Coimbatore South Forest Division.*

Serial number and description. (1)	Year of construction. (2)	Cost of construction. (3) RS. A. P.	Average annual cost of maintenance. (4) RS. A. P.	Remarks. (5)
TUNACADAVU RANGE.				
1 Spring at Topslip	1925–26 ..	1,649 1 0	19 6 0	
2 Reservoir at Karianshola and pipe line at Top-slip.	1927–28 ..	14,483 8 6	92 5 0	
3 Well and pipe line with force pump at Mount Stuart.	1932–33 ..	602 3 3	..	Cost of pipe line only. Well renewed at a cost of Rs. 204–15–0 in 1932–33. Not repaired for the last two years.
4 Draw well at Tekkadi	1939–40 ..	241 0 0	..	
5 Bore well at Sungam	1939–40 ..	219 0 0	..	
6 Well on the bank of the river near Pala-kadavu.	1936–37 ..	594 0 0	..	Not repaired for the last two years.
7 Palakadavu pipe line	1936–37 ..	184 0 6	13 9 0	
POLLACHI RANGE.				
8 Well at Sethumadai	Not known.	300 0 0	6 13 0	Valued by the Range officer.
9 Well in Overseer's compound at Sethumadai.	1920.. ..	960 0 0	..	Not repaired for the last three years.
10 Well at Tulukkamadai	1921–22 ..	249 8 0	10 5 0	
11 Drag well in Anamalai farm	1927 ..	245 0 0	7 10 0	
12 Big well in Anamalai farm	1923 ..	1,768 0 0	..	Acquired from Agricultural Department. Not repaired as not being used.
13 Irrigation channel and aqueduct at Anamalai farm.	1923 ..	510 0 0	..	
14 Well at Pollachi depot	1923–24 ..	299 12 0	27 6 0	
UDUMALPET RANGE.				
15 Well in Easalammanthorai rest-house ..	Not known	89 0 0	..	Valued by the Range officer. Not repaired for the past three years.
16 Well inside Range office compound at Udumal-pet.	1892 ..	29 0 0	..	Valued by the Range officer. Acquired from Judicial Department.
17 Hand pump to item 16	1939–40 ..	202 15 0	..	
18 Big well in the depot compound at Udumalpet.	1907 ..	500 0 0	....	Acquired through Revenue Department in 1907. Since handed over to Udumalpet Municipality.

SECTION 4—PAST YIELD.

275. *Yield.*—The following statements exhibit the past yields from the forests of the Coimbatore South Division from 1930–31 to 1939–40 :—

Statement showing yield of timber in South Coimbatore Division.

		Timber in cubic feet.								Piece product.	
Year.	Range.	Teak.	Rose wood.	Vengai.	Mesua.	Red cedar.	Kari-maradu.	Venteak.	Miscel-laneous.	Spokes and felloes. Sets.	Break poles. Num-bers.
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
1930–31 ..	Tunacadavu (Mount Stuart).	Specieswar yield not available. Total is shown in miscellaneous column.							116,373	295	..
	Ulandi	Do.							45,294	..	..
	Pollachi, Udumalpet, Punachi	12,313	4,642	3,874	44,951	2,184	..	..	695	68	800
	Total ..	**12,313**	**4,642**	**3,874**	**44,951**	**2,184**	..	..	**162,362**	**363**	**800**
1931–32 ..	Tunacadavu	43,329	2,993	22	..	..	5,965	12,517	8,075	254	..
	Ulandi	54,795	1,738	106	..	..	1,434	1,427	2,067	..	..
	Pollachi, Udumalpet, Punachi	19,764	6,490	5,285	44,879	2,139	..	..	228	42	2,767
	Total ..	**117,888**	**11,161**	**5,413**	**44,879**	**2,139**	**7,399**	**13,944**	**10,370**	**296**	**2,767**
1932–33 ..	Tunacadavu	670	369	..	..	..	1,396	164	464	..	..
	Ulandi	103,173	1,598	106	..	..	1,434	..	258	..	..
	Pollachi, Udumalpet, Punachi	..	..	113	45,470	..	..	..	12,136	..	2,000
	Total ..	**103,843**	**1,967**	**219**	**45,470**	..	**2,830**	**164**	**12,858**	..	**2,000**
1933–34 ..	Tunacadavu	39,261	2,784	710	..	..	2,220	10,790	3,196	313	..
	Ulandi	65,721	35,076	..	..	..	1,025	..	454	..	..
	Pollachi	..	..	..	..	..	..	..	..	..	..
	Udumalpet	..	..	..	..	..	..	..	..	..	..
	Punachi	1,661	480	400	..	..	..	..	..	2	3,411
	Total ..	**106,643**	**38,340**	**1,110**	..	..	**3,245**	**10,790**	**3,650**	**315**	**3,411**
1934–35 ..	Tunacadavu	54,391	5,180	340	..	..	3,339	9,927	5,568	361	..
	Ulandi	56,506	33,637	..	..	..	1,852	..	3,695	..	..
	Pollachi	..	..	..	..	..	..	..	..	..	..
	Udumalpet (from fuel coupe).	..	..	..	..	..	..	..	173	..	..
	Punachi	8,111	1,955	3,452	..	..	..	..	..	196	3,635
	Total ..	**119,008**	**40,772**	**3,792**	..	..	**5,191**	**9,927**	**9,436**	**557**	**3,635**
1935–36 ..	Tunacadavu	65,372	4,067	29	..	..	8,186	7,300	5,218	550	..
	Ulandi	64,260	31,770	..	..	..	243	91	4,547	..	..
	Pollachi (from fuel coupe).	..	..	..	..	..	..	..	3,750	..	..
	Udumalpet	..	..	..	..	..	..	..	..	..	..
	Punachi	841	375	1,336	35,016	2,100	..	..	2,395	111	4,100
	Total ..	**130,473**	**36,212**	**1,365**	**35,016**	**2,100**	**8,429**	**7,391**	**15,910**	**661**	**4,100**
1936–37 ..	Tunacadavu	68,769	2,280	..	..	..	10,018	1,859	8,585	433	298
	Ulandi	38,111	29,779	..	..	..	10,789	..	314	..	..
	Pollachi	..	..	..	..	..	..	..	..	..	..
	Udumalpet	..	..	..	..	..	..	..	..	..	..
	Punachi	2,956	489	205	32,944	1,344	..	..	940	164	3,210
	Total ..	**109,836**	**32,548**	**205**	**32,944**	**1,344**	**20,807**	**1,859**	**9,839**	**597**	**3,508**
1937–38 ..	Tunacadavu	68,729	5,161	180	..	..	21,713	5,558	12,837	916	..
	Ulandi	50,406	28,217	..	..	..	119	..	265	..	..
	Pollachi (from fuel coupe).	..	..	..	..	..	..	..	500	..	..
	Udumalpet	..	..	..	..	..	..	..	..	..	..
	Punachi	2,585	1,727	802	46,822	15	..	..	3,870	45	4,405
	Total ..	**121,720**	**35,105**	**982**	**46,822**	**15**	**21,832**	**5,558**	**17,472**	**961**	**4,405**
1958–39 ..	Tunacadavu	87,860	3,583	1,432	..	..	16,434	2,791	15,831	463	..
	Ulandi	22,666	21,312	..	..	..	1,156	..	5,744	..	..
	Pollachi	..	..	..	..	..	..	..	..	..	..
	Udumalpet	..	..	..	..	..	..	..	..	..	..
	Punachi	5,371	1,409	3,407	40,827	33	..	..	2,940	55	7,286
	Total ..	**115,897**	**26,304**	**4,839**	**40,827**	**33**	**17,590**	**2,791**	**24,515**	**518**	**7,286**
1939–40 ..	Tunacadavu	Species war yield is not available.							199,483	504	..
	Ulandi	Do.							40,000	..	..
	Pollachi	..	..	..	..	..	..	..	..	..	..
	Udumalpet	..	..	..	..	..	..	..	..	..	..
	Punachi	1,203	3,568	437	89,000	..	..	..	9,200	870	5,408
	Total ..	**1,203**	**3,568**	**437**	**89,000**	..	..	..	**248,683**	**1,374**	**5,408**

Statement showing yield of fuel in South Coimbatore Division.

	Year.									
Range.	1930–31.	1931–32.	1932–33.	1933–34.	1934–35.	1935–36.	1936–37.	1937–38.	1938–39.	1939–40.
	TONS.	TONS.	TONS.	TONS.	TONS.	TONS.	TONS.	TONS.	TONS.	TONS.
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
Tunacadavu ..	..	..	..	..	..	..	..	..	..	..
Ulandi	..	..	..	..	..	..	..	..	..	..
Pollachi	4,754 (Pollachi, Udumalpet, Punachi)	3,451 (Pollachi, Udumalpet, Punachi)	8,911 (Pollachi, Udumalpet, Punachi)	4,851·5	5,356·5	3,639·5	3,660·5	4,407	3,705·5	2,443
Udumalpet ..				2,109·0	2,292·0	1,422·0	1,635	1,505	2,288	1,656·5
Punachi				..	..	33·5	744·5	380	397·5	181
Total ..	**4,754**	**3,451**	**8,911**	**6,960·5**	**7,648·5**	**5,095·5**	**6,040·0**	**6,292**	**6,391·0**	**4,280·5**

Statement showing the yield of charcoal and bamboos in South Coimbatore Division.

Year.	Range.	Charcoal in bags.	Bamboos.							
			Bambusa, numbers.	*Dendrocalamus*, numbers.	Odai, numbers.	Bamboo thorn, head-load.	Split bamboo, numbers.	Bamboo chitties, numbers.	Bamboo reepers, numbers.	Bamboo rafters, numbers.
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
1930-31	Tunacadavu	..	..	..	..	..	..	..	..	..
	Ulandi	..	..	..	..	..	..	..	..	..
	Pollachi, Udumalpet, Punachi	..	455,600	..	..	..	..	..	..	..
	Total	..	**455,600**	..	..	..	..	..	..	..
1931-32	Tunacadavu	..	..	..	..	..	..	..	..	..
	Ulandi	..	..	..	..	..	..	..	..	..
	Pollachi, Udumalpet, Punachi	64	274,900	..	..	..	..	..	..	..
	Total	**64**	**274,900**	..	..	..	..	..	..	..
1932-33	Tunacadavu	..	29,550	..	..	1,560	5,680	..	..	..
	Ulandi	..	..	..	..	..	..	..	..	..
	Pollachi, Udumalpet, Punachi	..	744,000	..	..	..	..	..	..	..
	Total	..	**773,550**	..	..	**1,560**	**5,680**	..	..	..
1933-34	Tunacadavu	..	4,085	5,045	..	..	..	..	..	1,150
	Ulandi	..	..	..	..	..	..	..	..	..
	Pollachi	572	49,580	107,610	..	..	..	..	..	..
	Udumalpet	..	256	10,375	..	..	3,400	3,900	..	..
	Punachi	..	..	..	Not felled.	..	..	..	..	* ..
	Total	**572**	**53,921**	**123,030**	..	..	**3,400**	**3,900**	..	**1,150**
1934-35	Tunacadavu	..	16,965	14,375	..	..	..	..	..	10,835
	Ulandi	..	..	..	..	..	..	..	..	..
	Pollachi	..	35,864	97,565	5,082	4,941	6,001	..	..	..
	Udumalpet	..	16,301	14,690	..	..	2,000	..	..	..
	Punachi	..	22,000	..	..	..	..	..	..	..
	Total	..	**91,130**	**126,630**	**5,082**	**4,941**	**8,001**	..	..	**10,835**
1935-36	Tunacadavu	..	13,120	15,900	..	..	..	..	..	..
	Ulandi	..	..	..	..	..	..	..	..	..
	Pollachi	730	47,417	165,355	1,113	818	3,880	..	..	..
	Udumalpet	..	24,193	6,059	..	..	..	..	..	..
	Punachi	..	1,950	22,560	1,990	..	..	..	..	..
	Total	**730**	**86,680**	**209,274**	**3,103**	**818**	**3,880**	..	..	..
1936-37	Tunacadavu	..	9,932	7,625	..	596	..	..	..	5,003
	Ulandi	..	..	..	..	..	..	..	..	..
	Pollachi	1,346	22,220	146,836	..	1,017	2,125	..	..	..
	Udumalpet	..	7,300	5,670	..	1,670	8,605	..	..	..
	Punachi	..	29,500	1,000	..	145	..	..	..	..
	Total	**1,346**	**68,952**	**161,131**	..	**3,428**	**10,730**	..	..	**5,003**
1937-38	Tunacadavu	..	..	..	Not felled.	..	..	..	..	..
	Ulandi	..	..	..	..	..	..	..	..	..
	Pollachi	376	78,647	85,924	2,975	2,064	6,665	..	..	..
	Udumalpet	..	357	33,229	..	1,143	5,661	16,124	..	..
	Punachi	..	4,545	5,893	..	..	..	10,586	2,357	8,975
	Total	**376**	**83,549**	**125,046**	**2,975**	**3,207**	**12,326**	**26,710**	**2,357**	**8,975**
1938-39	Tunacadavu	..	22,175	..	..	..	..	..	..	36,295
	Ulandi	..	..	..	..	..	..	..	..	..
	Pollachi	1,705	61,183	63,307	1,516	1,011	4,675	..	..	..
	Udumalpet	..	1,095	1,21,900	..	..	10,275	9,200	..	..
	Punachi	..	1,186	1,657	3,412	50	1,515	..	..	..
	Total	**1,705**	**85,639**	**186,864**	**4,928**	**1,061**	**16,465**	**9,200**	..	**36,295**
1939-40	Tunacadavu	..	22,415	25,475	..	..	..	..	..	..
	Ulandi	..	..	..	..	..	..	..	..	..
	Pollachi	40	44,875	107,220	205	2,195	945	..	..	..
	Udumalpet	..	19,596	14,552	..	..	6,252	12,824	..	..
	Punachi						Figure not available.		..	..
	Total	**40**	**86,886**	**147,247**	**205**	**2,195**	**7,197**	**12,824**	..	..

* REMARKS.—Collected by local-purchasers and consumers.

Statement showing the yield of minor produce in South Coimbatore Division.

Year.	Range.	Number of elephants.	Seekai.	Poocha kottai.	Mangoes.	Sundakai.	Nellikai.	Velankai.	Kilakkai.	Tamarind.	Plantain leaves.	Korai grass.	Eacham grass.
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)
			T. QR.	T. QR.	T. QR.	T. QR.	T. QR.	T. QR.	T. QR.	T. QR.	T. QR.	T. QR.	T. QR.
1930–31	Tunacadavu	..	0 20	..	..	..		..	..	..	..	..	..
	Punachi, Pollachi, Udumalpet	..	..	3 26	0 30	1 27		0 8	0 60	27 18	0 39	0 5	74 39
	Total	..	0 20	3 26	0 30	1 27		0 8	0 60	27 18	0 39	0 5	74 39
1931–32	Tunacadavu	..	..	..	..	..		..	..	..	..	..	..
	Punachi, Pollachi, Udumalpet	..	..	1 54	24 50	4 45		0 8	5 20	69 7	5 32	2 27	55 8
	Total	..	..	1 54	24 50	4 45		0 8	5 20	69 7	5 32	2 27	55 8
1932–33	Tunacadavu	..	..	..	..	..		..	..	..	..	..	..
	Punachi, Pollachi, Udumalpet	..	0 51	1 63	3 24	1 14		..	2 57	123 74	..	0 11	47 77
	Total	..	0 51	1 63	3 24	1 14		..	2 57	123 74	..	0 11	47 77
1933–34	Tunacadavu	..	..	..	..	..	..	..	..	..	..	..	..
	Punachi	..	..	..	..	..	..	..	..	..	..	..	..
	Pollachi	..	0 42	..	0 66	0 2	1 36	..	..	0 50	0 26	..	4 2
	Udumalpet	..	..	..	..	1 59	1 55	..	3 46	10 75	..	0 32	88 61
	Total	..	0 42	..	0 66	1 61	3 11	..	3 46	11 45	0 26	0 32	92 63
1934–35	Tunacadavu	3	..	..	..	..	..	..	..	..	..	..	..
	Punachi	..	..	..	..	..	..	..	..	..	..	..	11 8
	Pollachi	..	..	..	..	..	..	..	..	..	0 14	..	0 10
	Udumalpet	..	..	..	0 14	0 4	0 5	..	2 65	7 40	..	0 10	21 51
	Total	3	..	..	0 14	0 4	0 5	..	2 65	7 40	0 14	0 10	32 69
1935–36	Tunacadavu	..	..	..	..	..	..	..	..	..	..	..	..
	Punachi	..	3 37	..	..	..	..	..	..	..	..	..	..
	Pollachi	..	..	..	..	..	..	..	..	..	..	..	0 60
	Udumalpet	..	..	..	..	8 74	6 68	..	13 32	12 72	..	1 44	64 22
	Total	..	3 37	..	..	8 74	6 68	..	13 32	12 72	..	1 44	65 2

1936–37 ..	Tunacadavu	..	..	..	..	..	..	..	..	..	..	..	..	..
	Punachi ..	..	..	0 55	..	..	..	..	..	..	..	..	..	..
	Pollachi ..	..	..	..	..	..	..	0 34	0 66	0 56	50 34	0 50	..	7 65
	Udumalpet	..	..	..	..	0 58	3 13	8 14	..	7 62	4 4	..	7 77	59 0
	Total ..	..	..	0 55	..	0 58	3 13	8 48	0 66	8 38	54 38	0 50	7.77	66 65
1937–38 ..	Tunacadavu	..	8	..	..	..	..	..	..	..	..	..	..	..
	Punachi ..	..	..	0 14	..	..	..	..	..	..	..	..	..	7 5
	Pollachi ..	..	..	0 50	..	3 28	0 48	0 32	0 10	0 12	31 76	6 28	..	10 34
	Udumalpet	..	..	..	..	0 23	1 50	0 45	..	2 55	16 0	2 40	..	37 36
	Total ..	..	8	0 64	..	3 51	2 18	0 77	0 10	2 67	47 76	8 68	..	54 75
1938–39 ..	Tunacadavu	..	..	8 Captures and 2 calves (born).				..	..	..	..	..	..	..
	Punachi ..	..	..	..	..	..	..	..	..	..	..	..	..	..
	Pollachi ..	..	..	0 54	..	..	..	0 8	0 10	..	20 65	0 54	..	5 26
	Udumalpet	..	..	..	..	0 23	1 69	0 56	..	8 72	20 50	..	0 50	63 18
	Total ..	..	10	0 54	..	0 23	1 69	0 64	0 10	8 72	41 35	0 54	0 50	68 44
1939–40 ..	Tunacadavu	..	..	..	..	..	..	..	..	..	..	..	..	..
	Punachi ..	..	..	..	..	..	..	..	..	..	..	..	..	2 40
	Pollachi ..	..	..	0 10	..	..	..	..	0 1	0 12	33 60	3 45	..	7 58
	Udumalpet	..	..	..	..	..	..	..	..	2 6	..	..	..	9 61
	Total ..	..	..	0 10	..	..	..	..	0 1	2 18	33 60	3 45	..	19 79

Statement showing the yield of minor produce in South Coimbatore Division—cont.

Year. (1)	Range. (2)	Ginger. (15) T. QR.	Mahali root. (16) T. QR.	Canes. (17) T. QR.	Dammar. (18) T. QR.	Peppadal. (19) T. QR.	Honey. (20) T. QR.	Wax. (21) T. QR.	Gall-nut. (22) T. QR.	Avaram and konnai bark. (23) T. QR.	Nanal grass. (24) T. QR.	Korai kodi. (25) T. QR.	Cardamum. (26) T. QR.	Stag horn. (27) T. QR.	Soapnut. (28) T. QR.	Ivory. (29) T. QR.
1930–31	Tunacadavu	..	3 13	..	..	..	..	..	..	..	..	..	..	..	3 35	..
	Punachi, Pollachi, Udumalpet	..	1 75	23 31	3 8	5 2	0 65	0 13	10 13	32 49	4 60	9 67	0 6	0 10	..	..
	Total	..	5 8	23 31	3 8	5 2	0 65	0 13	10 13	32 49	4 60	9 67	0 6	0 10	3 35	..
1931–32	Tunacadavu	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
	Punachi, Pollachi, Udumalpet	..	5 61	21 43	1 17	4 2	1 27	0 8	20 19	9 43	7 60	0 2	0 4	0 55	..	..
	Total	..	5 61	21 43	1 17	4 2	1 27	0 8	20 19	9 43	7 60	0 2	0 4	0 55	..	..
1932–33	Tunacadavu	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
	Punachi, Pollachi, Udumalpet	..	0 56	31 4	1 18	0 16	0 15	..	4 50	2 5	5 35	1 30	0 32	0 8	..	..
	Total	..	0 56	31 4	1 18	0 16	0 15	..	4 50	2 5	5 35	1 30	0 32	0 8	..	..
1933–34	Tunacadavu	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
	Punachi	0 1	..	2 25	1 11	..	..	0 ½	..	..	..	..	2 45	..	0 12	..
	Pollachi	..	7 28	..	..	0 62	..	..	26 14	30 29	..	..	..	..	0 44	..
	Udumalpet	..	..	22 50	0 1	..	0 39	..	19 25	78 0	2 20	4 0	..	..	3 64	..
	Total	0 1	7 28	24 75	1 12	0 62	0 39	0 ½	45 39	108 29	2 20	4 0	2 45	..	4 40	..
1934–35	Tunacadavu	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
	Punachi	0 2	..	37 60	2 48	..	0 7	0 7	8 11	..	..	..	2 74	0 .07	0 12	..
	Pollachi	..	0 16	..	..	..	..	..	0 73	..	..	..	..	..	..	..
	Udumalpet	..	..	15 15	..	0 5	0 42	0 20	20 40	42 10	0 15	2 5	..	..	..	..
	Total	0 2	0 16	52 75	2 48	0 5	0 49	0 27	29 44	42 10	0 15	2 5	2 74	0 .07	0 12	..
1935–36	Tunacadavu	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
	Punachi	0 .2	..	1 68	2 42	..	0 10·5	0 .5	..	..	..	..	2 46	..	..	0–1.4
	Pollachi	..	0 48	0 40	..	2 60	..	..	0 48	..	..	..	..	..	..	..
	Udumalpet	..	1 50	11 60	..	..	..	..	12 0	..	4 0	5 8	..	..	..	..
	Total	0 .2	2 18	14 8	2 42	2 60	0 10·5	0 .5	12 48	..	4 0	5 8	2 46	..	..	0–1.4

1936–37 ..	Tunacadavu	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
	Punachi ..	..	..	0 1	..	3 32	1 44	..	0 1	0 1	3 67	..	..	..	2 25	..	..	..
	Pollachi ..	..	..	0 28	9 37	..	0 30	1 34	..	0 4	1 16	..	..	..	..	..	0 20	..
	Udumalpet	..	..	..	5 58	19 22	..	..	0 5	0 2	16 45	..	0 40	1 71	..	..	2 11	..
	Total			0 29	15 15	22 54	1 74	1 34	0 6	0 7	21 48	..	0 40	1 71	2 25	..	2 31	..
1937–38 ..	Tunacadavu	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
	Punachi ..	..	.	0 11	..	3 5	0 57	..	..	0 3	8 61	..	..	..	0 78	..	..	..
	Pollachi ..	..	..	0 68	8 50	8 6	..	0 12	..	0 40	..	..	..	..	..	..	..	..
	Udumalpet	..	..	..	0 12	23 76	..	..	0 40	0 22	8 0	..	3 62	5 3	..	..	0 60	..
	Total ..			0 79	8 62	35 7	0 57	0 12	0 40	0 65	16 61	..	3 62	5 3	0 78	..	0 60	..
1938–39 ..	Tunacadavu	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
	Punachi ..	..	..	..	..	2 54	1 0	..	0 1	0 1½	..	..	..	..	1 49	..	..	..
	Pollachi ..	..	..	..	4 72	11 29	..	0 4	0 74	..	..	..	..	..	0 26	..	..	..
	Udumalpet	..	..	..	1 28	48 48	..	0 7	1 2	0 34	21 0	44 17	11 62	27 22	..	..	4 0	..
	Total ..			..	6 20	62 51	1 0	0 11	1 77	0 35½	21 0	44 17	11 62	27 22	1 75	..	4 0	..
1939–40 ..	Tunacadavu	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
	Punachi ..	..	..	0 12	..	8 0	1 37	0 17	..	..	..	..	..	..	0 71	..	0 28	..
	Pollachi ..	..	..	..	6 46	9 70	..	0 64	..	..	..	..	..	..	0 20	..	1 4	..
	Udumalpet	..	..	..	..	1 50	..	..	..	..	17 22	25 31	..	..	..	..	..	..
	Total ..			0 12	6 46	19 40	1 37	1 1	..	..	17 22	25 31	..	..	1 11	..	1 32	..

Consolidated statement showing the products removed in South Coimbatore Division on permits from 1930–31 to 1939–40.

Year.	Agricultural implements numbers.	Fire wood. Cart-load.	Fire wood. Head-load.	Shed material.	Odal leaves, head loads.	Chiselled stone in cart-load.	Rough stone in cart-load.	Earth in cart-load.	Gravel in cart-load.	Metal in cart-load.	Brake poles in numbers.	Reeds, head-loads.
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
1930–31	708	14	..	..	16	16	100	1,626	2,495	900	..	..
1931–32	588	7	..	..	24	24	1,042	610	3,725	1,150	82	..
1932–33	500	37	..	..	..	..	2,581	770	..	6,945	..	40
1933–34	..	48	..	..	31	..	..	..	..	139 units.	..	160
1934–35 ..	..	28	..	..	10	..	..	..	..	95 units.	..	20
1935–36	..	..	..	..	..	..	..	..	..	..	..	..
1936–37	..	..	..	..	..	..	..	..	..	..	..	..
1937–38	..	..	..	..	..	..	..	..	..	..	..	..
1938–39	..	..	..	..	..	..	..	..	..	..	..	..
1939–40	..	..	..	..	..	..	..	..	..	..	..	..
Total ..	**1,796**	**134**	..	..	**81**	**40**	**3,723**	**3,006**	**6,220**	**8,995 + 234 units.**	**82**	**220**

SECTION 5.—PAST REVENUE AND EXPENDITURE.

276. *Past revenue and expenditure.*—The following statements exhibit the revenue and **expenditure** in the Coimbatore South **Forest** Division from 1930–31 to 1939–40 :—

Statement of revenue realized in the Coimbatore South Forest Division from 1930–31 *to* 1939–40—*Rangewar.*

Year.	By Government agency. Timber.	Fuel.	Bamboos.	Other produce.	By purchasers and consumers. Timber.	Fuel.	Bamboos.	Grazing and fodder grass.	Minor forest produce.	Fines and forfeitures.	Confiscated produce rents.	Rents.	Revenue departmental collections.	Others.	Total.
(1)	(2)	(3).	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)
	RS.	RS.	RS.	RS.	RS.	RS.	RS.	RS.	RS.	RS.	RS.	RS.	RS.	RS.	RS.
							TUNACADAVU RANGE.								
1930–31	..	..	..	366	..	312	..	..	500	..	..	3,383	..	(a) 61,656	66,217
1931–32	..	..	..	247	560	..	131	..	..	..	..	3,297	..	(a) 36,639	40,874
1932–33	88,898	..	103	..	180	..	394	..	..	52	..	1,117	..	1,743	92,487
1933–34	79,023	..	..	246	426	..	133	10	..	30	..	1,267	..	2,255	83,390
1934–35	1,83,413	..	..	993	345	15	623	31	..	1	..	1,258	..	1,456	1,88,135
1935–36	1,12,796	..	..	11	300	..	675	35	..	100	..	1,346	..	1,770	1,17,033
1936–37	1,62,084	..	..	98	356	..	379	..	..	36	30	1,106	..	5,718	1,69,807
1937–38	1,59,395	..	..	374	714	45	..	..	..	310	..	1,080	..	3,372	1,65,290
1938–39	1,76,240	..	..	..	299	..	705	..	..	..	8	1,162	..	5,840	1,84,254
1939–40	2,07,619	..	..	449	376	..	398	..	..	1	6	1,036	..	2,852	2,12,737
							ULANDI RANGE.								
1930–31	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
1931–32	..	..	..	3,500	39,838	..	..	..	..	100	..	..	..	123	43,561
1932–33	..	..	..	..	63,374	..	..	..	255	..	..	94	..	74	63,797
1933–34	2	..	..	57	32,828	..	405	..	300	20	..	247	..	41	33,900
1934–35	..	..	..	249	65,947	..	..	..	..	..	..	232	..	151	66,579
1935–36	..	..	..	..	79,551	..	..	..	300	..	..	291	..	96	80,238
1936–37	..	..	..	130	42,518	..	..	..	..	..	..	233	..	69	42,950
1937–38	..	..	..	..	47,598	..	..	..	300	..	..	242	..	88	48,228
1938–39	..	..	..	..	28,524	..	..	..	300	..	..	272	..	108	29,204
1939–40	..	..	..	14	23,935	..	..	..	300	1	..	231	..	104	24,585

· Includes profits from Government Commercial undertakings and Indirect charges.

Statement of revenue realized in the Coimbatore South Forest division from 1930–31 to 1939–40—Rangewar -cont.

Year.	By Government agency.				By purchasers and consumers.										
	Timber.	Fuel.	Bamboos.	Other produce.	Timber.	Fuel.	Bamboos.	Grazing and fodder grass.	Minor forest produce.	Fines and forfeitures.	Confiscated produce rents.	Rents.	Revenue departmental collections.	Others.	Total.
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)
	RS.	RS.	RS.	RS.	RS.	RS.	RS.	RS.	RS.	RS.	RS.	RS.	RS.	RS.	RS.
PUNACHI RANGE.															
1930–31	*1,83,340	..	..	73	492	23	..	55	370	..	..	326	..	584	1,85,263
1931–32	*1,20,328	..	..	..	535	9	..	58	1,029	725	4	497	..	699	1,23,884
1932–33	*1,21,828	..	..	413	1,229	51	300	111	1,073	11	..	601	..	480	1,26,097
1933–34	41,294	..	..	57	8	53	..	104	956	..	..	301	..	333	43,106
1934–35	5,994	..	..	248	744	35	103	104	1,225	..	..	319	12	640	9,424
1935–36	65,817	..	..	..	1,030	14	..	109	1,066	25	..	356	..	454	68,871
1936–37	57,511	..	..	..	3,385	151	..	107	1,335	30	..	329	..	468	63,316
1937–38	77,376	..	..	..	3,249	692	..	126	956	100	..	392	..	555	83,446
1938–39	68,979	..	..	..	570	824	315	169	938	..	4	398	..	663	72,860
1939–40	63,148	158	..	14	343	1,543	58	72	910	26	..	350	..	506	67,128
POLLACHI RANGE.															
1930–31	..	..	..	73	932	11,375	7,215	2,188	3,337	29	19	378	..	1,474	27,020
1931–32	132	..	..	1	244	8,736	4,864	1,824	2,114	80	14	348	..	1,409	19,776
1932–33	11	..	..	..	642	9,394	2,129	1,874	1,919	108	25	515	..	1,176	17,793
1933–34	42	..	..	69	..	9,599	3,850	1,950	3,341	56	20	631	999	1,150	21,707
1934–35	100	15	..	248	432	11,469	3,258	2,487	965	135	..	346	1,012	1,756	22,223
1935–36	..	7	..	..	63	5,946	2,663	3,555	935	203	83	603	1,024	1,543	16,625
1936–37	5	11	..	..	..	2,878	2,934	3,076	908	296	40	590	1,130	1,274	13,142
1937–38	40	..	..	..	13	4,494	2,318	3,159	1,082	148	21	415	698	1,050	13,438
1938–39	98	..	..	..	..	7,366	1,738	1,843	1,058	59	18	350	505	1,178	14,213
1939–40	..	27	..	14	56	4,739	4,053	1,772	990	127	15	439	467	2,052	14,751
UDUMALPET RANGE.															
1930–31	..	121	..	75	1,512	7,290	780	2,392	4,751	51	28	203	..	2,124	19,327
1931–32	..	55	..	..	802	6,404	385	2,399	3,589	..	9	220	..	1,738	15,601
1932–33	..	30	..	23	608	5,342	516	2,174	5,010	43	15	339	..	2,086	16,186
1933–34	..	3	..	63	35	4,709	860	2,346	2,441	..	..	236	2,874	2,095	15,680
1934–35	..	46	..	249	34	5,119	1,620	3,622	2,632	215	..	306	4,164	1,798	19,805
1935–36	..	..	..	..	26	4,381	1,210	4,913	2,725	90	59	231	2,411	1,845	17,891
1936–37	..	..	..	..	38	4,227	773	4,174	2,698	150	243	259	2,804	2,474	17,840
1937–38	..	13	..	..	44	2,009	180	3,742	2,906	244	10	269	2,703	2,594	14,714
1938–39	3	..	..	9	43	2,670	1,445	2,859	3,099	10	324	270	1,465	1,400	13,597
1939–40	..	..	..	14	24	4,497	698	2,330	1,514	140	125	247	1,629	1,511	12,729

* Includes revenue realized from Valparai project.

Statement of expenditure incurred in the Coimbatore South Forest Division from 1930–31 to 1939–40—Rangewar.

Year.	Depart-mental extraction and collection.	Cutting coupe lines and expendi-ture on B II timber.	Stores and feed etc., of cattle (elephants).	Roads.	Buildings.	Other works.	Demar-cation.	Cultural operation.	Fire protection.	Other works under organiza-tion improve-ment and exten-sion of forests.	Miscel-laneous.	Pay of estab-lishment.	Travelling allowances and com-pensatory allowances.	Contin-gencies.	Total.
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)
	RS.	RS.	RS.	RS.	RS.	RS.	RS.	RS.	RS.	RS.	RS.	RS.	RS.	RS.	RS.
							TUNACADAVU RANGE.								
1930–31	37	..	12,107	..	738	1,575	—12,045	12,306	1,033	357	2,540	29,546	6,690	3,253	58,137
1931–32	— 401	..	6,163	207	574	1,569	— 7	11,081	1,622	244	2,843	26,888	4,449	2,015	57,247
1932–33	10,513	..	15,775	7,520	1,476	913	29	6,421	1,451	432	4,400	30,131	4,361	2,961	86,383
1933–34	25,755	..	14,080	8,296	1,354	495	79	7,321	1,014	525	6,028	31,039	6,445	2,670	1,05,101
1934–35	28,344	..	14,714	11,994	673	944	44	6,597	1,514	420	5,018	33,863	5,722	2,508	1,12,355
1935–36	25,287	..	15,215	15,268	832	1,282	31	5,978	1,377	450	5,079	34,511	5,972	2,728	1,14,010
1936–37	36,955	..	16,390	32,213	1,224	853	22	5,430	640	576	5,000	36,220	6,356	2,030	1,43,909
1937–38	35,181	..	18,475	31,900	6,575	897	20	5,713	775	568	5,000	34,554	6,053	1,701	1,47,412
1938–39	32,707	..	20,375	19,058	1,756	1,179	20	6,195	941	408	5,004	34,877	5,933	2,537	1,30,990
1939–40	52,009	..	22,884	11,838	1,330	2,233	68	6,359	714	256	5,000	31,063	6,171	3,137	1,43,062
							ULANDI RANGE.								
1930–31	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
1931–32	108	205	20	..	5,190	..	18	197	102	19	..	6,274	1,016	527	13,676
1932–33	7	388	20	1,077	1,167	..	120	602	106	60	9	6,523	908	613	11,600
1933–34	..	477	60	140	275	469	62	3,038	148	607	..	7,560	1,377	456	14,669
1934–35	61	563	155	50	166	576	80	4,726	310	100	..	7,300	1,091	612	15,790
1935–36	..	731	105	..	530	..	87	3,315	234	393	..	7,429	1,221	608	14,653
1936–37	44	691	481	50	97	563	85	3,119	257	81	..	8,091	1,575	572	15,706
1937–38	4	608	24	82	660	335	83	2,747	223	..	..	6,816	1,590	453	13,625
1938–39	..	669	31	40	161	96	85	2,661	359	61	2	7,306	1,362	488	13,321
1939–40	..	520	18	104	319	133	..	1,859	367	94	..	6,600	1,245	486	11,745
							PUNACHI RANGE.								
1930–31	* 87,596	..	6,535	3,650	859	43	50	965	358	27	482	15,374	3,037	555	1,19,531
1931–32	* 69,043	..	4,442	4,459	1,048	25	35	757	324	..	110	12,415	2,472	362	95,492
1932–33	* 66,749	..	58	3,221	1,169	30	86	873	334	44	56	10,345	1,893	585	85,443
1933–34	3,750	..	643	882	780	15	147	838	358	130	3	8,620	1,599	320	18,085
1934–35	1,428	26	1,344	1,135	477	10	38	865	388	67	15	8,448	1,439	530	16,210
1935–36	47,590	131	211	3,105	234	6	44	714	299	77	7	10,493	1,952	503	65,366
1936–37	42,762	135	295	4,638	400	8	44	1,296	344	54	..	10,891	2,431	471	63,769
1937–38	58,691	149	24	3,681	329	14	43	1,569	318	..	..	10,665	2,474	373	78,330
1938–39	50,255	147	1,004	4,062	302	52	39	2,279	399	74	2	10,488	2,213	377	71,693
1939–40	47,525	28	18	4,287	230	6	44	1,259	316	55	37	11,047	2,548	476	67,976

* Includes expenditure incurred in Valparai project.

Statement of expenditure incurred in the Coimbatore South Forest Division from 1930–31 to 1939–40—Rangewar—cont.

Year.	Departmental extraction and collection.	Cutting coupe lines and expenditure on B II timber.	Stores and feed, etc., of cattle (elephants).	Roads.	Buildings.	Other works.	Demarcation.	Cultural operation.	Fire protection.	Other works under organization, improvement and extension of forests.	Miscellaneous.	Pay of establishment.	Travelling allowances and compensatory allowances.	Contingencies.	Total.
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)
	RS.	RS.	RS.	RS.	RS.	RS.	RS.	RS.	RS.	RS.	RS.	RS.	RS.	RS.	RS.
							POLLACHI RANGE.								
1930–31	281	1,456	6	783	987	20	69	108	..	1,009	9	8,607	1,905	547	15,787
1931–32	..	1,344	29	201	759	25	32	..	..	20	128	8,380	1,537	405	12,860
1932–33	..	1,240	38	48	510	11	26	..	12	32	27	6,910	923	646	10,423
1933–34	..	1,165	9	395	396	8	310	46	4	14	33	7,296	1,169	339	11,184
1934–35	..	1,105	..	286	501	15	90	54	3	10	75	7,526	1,063	528	11,256
1935–36	5	1,000	67	252	614	68	86	458	..	11	31	8,395	1,301	479	12,767
1936–37	..	1,036	40	26	887	22	68	226	..	9	9	9,688	1,646	462	14,119
1937–38	..	952	30	89	1,075	17	170	151	..	..	10	9,728	1,486	308	14,016
1938–39	132	996	32	75	453	22	109	153	..	..	..	9,725	1,231	322	13,250
1939–40	97	948	18	153	538	14	360	99	..	116	10	10,913	1,315	374	14,955
							UDUMALPET RANGE.								
1930–31	114	1,473	37	285	2,627	58	100	..	..	320	5	9,152	2,005	594	16,770
1931–32	..	1,341	67	299	735	61	48	..	..	99	112	9,065	1,187	377	13,391
1932–33	..	1,284	40	314	1,084	20	554	5	..	243	46	7,453	1,069	623	12,735
1933–34	..	1,173	9	188	312	10	94	..	..	329	139	8,303	1,392	335	12,284
1934–35	..	1,231	5	133	289	10	248	81	9	73	5	8,071	1,043	496	11,694
1935–36	..	1,262	26	195	1,159	10	60	232	10	18	103	7,884	1,049	492	12,500
1936–37	..	1,301	33	269	717	20	84	175	..	..	20	9,304	1,254	443	13,620
1937–38	..	1,273	24	191	482	..	8	141	..	..	1	9,239	1,283	303	12,945
1938–39	..	1,280	29	205	548	9	109	86	..	50	..	8,344	1,389	342	12,391
1939–40	1	1,389	20	153	628	452	456	23	..	57	39	8,379	1,416	356	13,369

Summary of revenue realized in the Coimbatore South Forest Division from 1930–31 *to* 1939–40.

Year.	By Government agency.				By purchasers and consumers.										
Year.	Timber.	Fuel.	Bamboos.	Other produce.	Timber.	Fuel.	Bamboos.	Grazing and fodder grass.	Minor Forest produce.	Fines and forfeitures.	Confiscated produce	Rents.	Revenue departmental collections.	Other sources.	Total.
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)
	RS.	RS.	RS.	RS.	RS.	RS.	RS.	RS.	RS.	RS.	RS.	RS.	RS.	RS.	RS.
1930–31	1,83,340	121	..	587	2,936	19,000	7,995	4,635	8,958	80	47	4,290	..	65,838	2,97,827
1931–32	1,20,460	55	..	3,748	41,979	15,149	5,380	4,281	6,732	905	27	4,362	..	40,608	2,43,686
1932–33	2,10,737	30	103	436	66,033	14,787	3,339	4,159	8,257	214	40	2,666	..	5,559	3,16,360
1933–34	1,20,361	3	..	492	33,297	14,361	5,248	4,410	7,038	106	38	2,682	3,873	5,874	1,97,783
1934–35	1,89,507	61	..	1,987	67,502	16,638	5,604	6,244	4,822	351	..	2,461	5,188	5,801	3,06,166
1935–36	1,78,613	7	..	11	80,970	10,341	4,548	8,612	5,026	418	142	2,827	3,435	5,708	3,00,658
1936–37	2,19,600	11	..	228	46,285	7,410	4,523	8,096	4,968	452	129	2,489	3,541	9,374	3,07,106
1937–38	2,36,811	13	..	374	51,618	7,240	2,498	7,027	5,244	802	31	2,398	3,401	7,659	3,25,116
1938–39	2,45,320	..	..	9	29,436	10,860	4,203	4,871	5,395	69	354	2,452	1,970	9,189	3,14,128
1939–40	2,70,767	185	..	505	24,734	10,779	5,207	4,174	3,714	295	146	2,303	2,096	7,025	3,31,930

Summary of expenditure incurred in the Coimbatore South Forest Division from 1930–31 *to* 1939–40.

Year.	Departmental extraction and collection.	Cutting coupe lines and expenditure on B II timber.	Stores and feed, etc., of cattle (elephants).	Roads.	Buildings.	Other works.	Demarcation.	Cultural operation.	Fire protection.	Other works under organization, improvement and extension of forests.	Miscellaneous.	Pay of establishment.	Travelling allowances and compensatory allowances.	Contingencies.	Total.
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)
	RS.	RS.	RS.	RS.	RS.	RS.	RS.	RS.	RS.	RS.	RS.	RS.	RS.	RS.	RS.
1930–31	88,028	2,929	18,685	4,718	5,211	1,696	— 11,826	13,379	1,391	1,713	3,036	62,679	13,637	4,949	2,10,225
1931–32	68,750	2,890	10,721	5,166	8,306	1,680	126	12,035	2,048	382	3,193	63,022	10,661	3,686	1,92,666
1932–33	77,269	2,912	15,931	12,180	5,406	974	815	7,901	1,903	811	4,538	61,362	9,154	5,428	2,06,584
1933–34	29,505	2,815	14,801	9,901	3,117	997	692	11,243	1,524	1,605	6,203	62,818	11,982	4,120	1,61,323
1934–35	29,833	2,925	16,218	13,598	2,106	1,555	500	12,323	2,224	670	5,113	65,208	10,358	4,674	1,67,305
1935–36	72,882	3,124	15,624	18,820	3,369	1,366	308	10,697	1,920	949	5,520	68,712	11,495	4,810	2,19,296
1936–37	79,761	3,163	17,239	37,196	3,325	1,466	303	10,246	1,241	720	5,029	74,194	13,262	3,978	2,51,123
1937–38	93,876	2,982	18,577	35,943	9,121	1,263	324	10,321	1,316	568	5,011	71,002	12,886	3,138	2,66,328
1938–39	83,094	3,092	21,471	23,440	3,220	1,358	362	11,374	1,699	593	5,008	70,740	12,128	4,066	2,41,645
1939–40	99,632	2,985	22,958	16,535	3,045	2,838	928	9,599	1,397	578	5,086	68,002	12,695	4,829	2,51,107

Statement showing the financial position in the Coimbatore South Forest Division from 1930–31 to 1939–40.

	Summary of		
(1)	Revenue. (2) RS.	Expenditure. (3) RS.	Profit. (4) RS.
1930–31	2,97,827	2,10,225	87,602
1931–32	2,43,686	1,92,666	1,51,020
1932–33	3,16,360	2,06,584	1,09,776
1933–34	1,97,783	1,61,323	36,460
1934–35	3,06,166	1,67,305	1,38,861
1935–36	3,00,658	2,19,296	81,362
1936–37	3,07,106	2,51,123	55,983
1937–38	3,25,116	2,66,328	58,788
1938–39	3,14,128	2,41,645	72,483
1939–40	3,31,930	2,51,107	80,823

SECTION 6.—ADMINISTRATION.

277. *District Forest Officers.*—The following District Forest Officers have held charge of the Coimbatore South Forest Division in the years noted against them :—

Serial number and name of officers.	Period.
1 Mr. A. Wimbush	1st July 1919 to 24th February 1920.
2 ,, E. M. Crothers	25th February to 1st April 1920.
3 ,, J. S. Scot	2nd April to 26th October 1920.
4 ,, W. G. Dyson	27th October 1920 to 4th May 1923 (except for 22 days in February 1922 when Mr. C. Dupre Thornton, District Forest Officer, Coimbatore North, was in charge of current duties).
5 ,, M. F. Bridge	5th May 1923 to 7th July 1924.
6 ,, J. D. Cannolly	8th July 1924 to 23rd March 1925.
7 ,, R. S. Browne	24th March to 16th November 1925.
8 ,, J. M. Sweet	17th November 1925 to 20th October 1930.
9 ,, D. McD. Currie	21st October 1930 to 21st December 1933.
10 ,, M. F. Bridge	22nd December 1933 to 15th July 1935.
11 ,, W. C. Hart	16th July to 22nd November 1935.
12 ,, H. P. Ward	23rd November 1935 to 30th March 1938 (except from 1st to 17th February 1936 when Mr. M. C. Chandy, was in charge of the division).
13 ,, J. A. Master	31st March to 7th August 1938.
14 Sri P. Govinda Menon	8th August to 4th October 1938.
15 Mr. D. McD. Currie	5th October 1938 to date.

CHAPTER VI—STATISTICS OF GROWTH AND YIELD

278. *Mr. Wood's ring countings.*—Mr. H. F. A. Wood carried out ring countings on the stumps of 15 felled teak trees, during the preparation of his working plan (1916–18). The stumps appear to have been selected in an unusually good locality. The following statement, prepared from Mr. Wood's curve, shows the girths over bark at breast height for the ages shown against them :—

Girth over bark at breast height.	Age in years.	Girth over bark at breast height.	Age in years.
3 feet	46	6 feet	103
4 ,, ...	62	7 ,, ...	142
5 ,, ...	73	8 ,, ...	218

279. *Mr. Wood's stem analysis.*—Mr. Wood also made stem analyses of two teak trees and one rosewood tree. The results will be found in Chapter VI of Part I of Mr. Laurie's working plan.

280. *Mr. Laurie's volume outturn tables.*—Mr. Laurie prepared volume outturn tables for teak, *Dalbergia latifolia, Pterocarpus marsupium, Terminalia paniculata, Terminalia tomentosa, Lagerstrœmia lanceolata* and *Grewia tiliæfolia* from old felling registers. The volume tables were prepared for one-foot girth classes and ten-foot height classes and for round timber. The accuracy of the tables was doubted by Mr. Laurie himself as they were based on insufficient data and they were subsequently found to be unsatisfactory because the estimate of height classes was often widely inaccurate and the local practice of square dressing timber introduced a further error.

281. *New local outturn tables.*—New local outturn tables were subsequently prepared by the Provincial Silviculturist for various species based on local conversion practice. One-foot girth classes were adopted but height classes were ignored. Tables were prepared separately for Tunacadavu and Punachi ranges and for teak, rosewood, *Terminalia tomentosa, Terminalia paniculata* and *Lagerstrœmia lanceolata.* A similar volume table for

Grewia tiliæfolia was prepared by the writer for Thunachadavu range from figures collected from felling registers. These tables have been used in estimating probable yields from future coupes. They are reproduced below :—

Local volume table—Teak.

Mount Stuart. 1,171 trees (1930–31 regeneration area).

(Prepared by the Provincial Silviculturist in 1934.)

Girth.	Volume in cubic feet.	Girth.	Volume in cubic feet.
2′–3′	6	10′–11′	142
3′–4′	12	11′–12′	170
4′–5′	23	12′–13′	202
5′–6′	36	13′–14′	232
6′–7′	54	14′–15′	267
7′–8′	74	15′–16′	292
8′–9′	93	16′–17′	330
9′–10′	116		

Local volume table—Grewia tiliæfolia.

Mount Stuart. 128 trees.

(Prepared by the Working Plans Officer.)

Girth.	Volume in cubic feet.	Girth.	Volume in cubic feet.
3′–4′	18	7′–8′	64
4′–5′	30	8′–9′	75
5′–6′	41	9′–10′	86
6′–7′	52		

Local volume table—Terminalia tomentosa.

Mount Stuart 793 trees. Fellings 1929-1931. Local conversion practice.

(Prepared by the Provincial Silviculturist in 1934.)

Girth.	Volume in cubic feet.	Girth.	Volume in cubic feet.
2′–3′	8	8′–9′	82
3′–4′	13	9′–10′	105
4′–5′	20	10′–11′	132
5′–6′	30	11′–12′	162
6′–7′	46	12′–13′	190
7′–8′	62	13′–14′	210

Local volume table—Lagerstrœmia lanceolata.

Mount Stuart 311 trees. Local conversion practice.

(Prepared by the Provincial Silviculturist in 1932.)

Girth.	Volume in cubic feet.	Girth.	Volume in cubic feet.
2′–3′	8	6′–7′	59
3′–4′	15	7′–8′	79
4′–5′	23	8′–9′	102
5′–6′	39	9′–10′	126

Local volume table—Dalbergia latifolia and Terminalia paniculata.

Mount Stuart. 102 trees. Local conversion practice.

(Prepared by the Provincial Silviculturist in 1932).

Girth.	Volume in cubic feet.	Girth.	Volume in cubic feet.
2′–3′	5	6′–7′	46
3′–4′	10	7′–8′	66
4′–5′	19	8′–9′	91
5′–6′	31	9′–10′	121

Local volume table—Dalbergia latifolia.

Punachi. 245 trees. Local conversion practice.

(Prepared by the Provincial Silviculturist).

Girth.	Volume in cubic feet.	Girth.	Volume in cubic feet.
2′–3′	6	7′–8′	56
3′–4′	10	8′–9′	80
4′–5′	17	9′–10′	108
5′–6′	25	10′–11′	144
6′–7′	38	11′–12′ and over	186

Local volume table—Teak.

Punachi. 908 trees felled in 1931. Local conversion practice.

(Prepared by the Provincial Silviculturist in 1934).

Girth.	Volume in cubic feet.	Girth.	Volume in cubic feet.
3′–4′	11	9′–10′	78
4′–5′	16	10′–11′	98
5′–6′	25	11′–12′	111
6′–7′	33	12′–13′	122
7′–8′	48	13′ and over	128
8′–9′	62		

282. *Quality class maps of teak plantations.*—All teak plantations over 5 years old in 1940 (April) were stockmapped so as to assess the area in each of them which may be allotted to the different All-India quality classes. A convenient base line was taken for each plantation and strips were cut at right angles to the base line at intervals of three chains. Every strip was then measured and pegged at each chain. The tallest tree in each square chain on either side of the strip was measured with trailer tape and special Abney and recorded, thus securing the heights of the tallest tree in every square chain in two adjacent strips, omitting one intermediate strip. The tallest tree in every tenth square chain of the intermediate strip was also measured, the fifth, fifteenth, twenty-fifth etc., squares being measured from one strip and the tenth, twentieth, thirtieth, etc., squares from the next strip and so on. Blanks, streams, inspection paths, swamps, and such other features were marked in as they cut in lines. The base and strip lines were then plotted on squared paper, and the height measurements were entered in the respective squares. The heights were then grouped together according to the quality classes shown against the age of the plantation in the All-India tables printed in Appendix (*b*) of the plan, and coloured so as to distinguish the classes. These quality class maps will be found useful in assessing the proper espacement of stems at the time of thinning.

The teak plantations of Coimbatore South Division fall under the different all-India quality classes as shown below :—

Range. (1)	Quality class. (2)	Area in acres. (3)	Remarks. (4)
Tunacadavu	I	1.1	In Mount Stuart 1934 and Palakadavu 1932 and 1934.
Do.	II	58·7	Mainly in Palakadavu.
Do.	III	564·36	
Do.	IV	892·70	
Do.	V	276·1	
Do.	Below V	17·5	
Total ..		1,810·46	
Punachi	III	0·4	
Do.	IV	6·2	
Do.	V	19.0	
Do.	Below V	4·0	
Total ..		29·6	

283. *Diameter increment of plantation teak in Tunacadavu range.*—In order to arrive at an indication of the probable rotation for plantation teak in Tunacadavu range, sample plots were selected in all existing plantations, from 1935 and up, and the diameters of dominant and co-dominant teak trees in each sample plot were measured. The plantations had already been stock-mapped so as to show the distribution of quality classes in each and it was found that qualities III and IV (All-India) extended over the major part. Sample plots were therefore selected in each of these quality classes. The plots were on the average 0·4 acres each. The data were forwarded to the Provincial Silviculturist for the preparation of curves showing the relationship of crop-diameter to age. The curves prepared by him indicate that, for the Tunacadavu plantations up to 25 years of age, the crop-diameters are considerably higher than the average All-India figures for both the qualities III and IV, as may be seen from the subjoined statement prepared from the curves :—

Age in years.	Mount Stuart crop—diameter in inches.		All-India crop—diameter in inches.	
	Quality III.	Quality IV.	Quality III.	Quality IV.
(1)	(2)	(3)	(4)	(5)
5	4·0	3·4	..	..
10	6·3	5·6	4·8	3·7
15	8·0	7·0	6·2	4·4
20	9·2	8·3	7·6	5·1
25	10·4	9·6	9·0	5·7

It will be seen, in addition, that the Mount Stuart crop-diameters for quality IV are higher than the All-India diameters for quality III. This considerable difference in favour of the Mount Stuart plantations might be due to a more suitable degree of thinning which they have had. The results indicate that the rotation for properly thinned plantation teak in this locality is likely to be considerably shorter than what was judged necessary in the past. The curves have been filed with the working plan records.

284. *Volume outturn table for Mesua ferrea.*—The subjoined volume and sleeper outturn statement for *Mesua ferrea* in the Kalar valley has been prepared from data based on 985 trees felled in the past. Figures for trees of 10 feet girth and over are less accurate than for those below :—

Breast height girth over bark. FT.	IN.	Volume of timber in cubic feet.	Outturn in broad gauge units.	Breast height girth over bark. FT.	IN.	Volume of timber in cubic feet.	Outturn in broad gauge units.
4	0	26	4·5	10	6	134	18·0
4	6	31	5·3	11	0	140	18·8
5	0	36	6·2	11	6	146	19·5
5	6	43	7·2	12	0	150	20·3
6	0	50	8·3	12	6	154	21·0
6	6	59	9·4	13	0	158	21·8
7	0	68	10·7	13	6	162	22·3
7	6	78	11·9	14	0	165	23·0
8	0	88	13·1	15	0	170	24·3
8	6	99	14·2	16	0	176	25·0
9	0	109	15·3	17	0	180	26·0
9	6	118	16·3	18	0	184	26·8
10	0	126	17·0	19	0	188	27·3
				20	0	191	28·0

N.B.—This statement is abridged from the one on page 39 of Mr. A. N. Sarma's Working plan.

CHAPTER VII.—CAPITAL VALUE OF THE FOREST.

285. *Absence of data.*—There are no reliable data for the determination of the capital value of the forests dealt with.

PART II

Future management discussed and prescribed.

CHAPTER I.—BASIS OF PROPOSALS.

SECTION 1.—OBJECTS OF MANAGEMENT.

286. *General.*—The forests dealt with are valuable in that they form the catchment areas of streams feeding irrigation channels and tanks in Pollachi, Udumalpet, Dharapuram and Karur taluks. They are also the most important and the nearest source of supply of timber and other forest produce to the inhabitants of these taluks. The limits of cultivation in the adjoining villages come up practically to the foot of the hills, so that the forests are mainly on slopes of hills and on plateaux, which require to be preserved from denudation.

287. *Main objects of management.*—The main objects of management should therefore be—

(*a*) protection and conservation of the forests on steep hillsides and high ranges,

(*b*) provision of a sustained annual yield of timber, fuel and bamboos to the fullest extent possible,

(*c*) exploitation of mature and marketable trees which would otherwise deteriorate, and

(*d*) improvement of the quality of the forest as quickly as practicable by regenerating them in an inexpensive manner with the more valuable and useful species yielding timber and other produce.

SECTION 2.—METHODS OF TREATMENT.

288. *Deciduous timber forests.*—The deciduous timber forests will be clearfelled and converted into plantations of valuable species such as teak and *Dalbergia latifolia.* The method of ponam regeneration will be adopted to the fullest possible extent so as to keep down regeneration costs.

289. *Evergreen forests.*—Evergreen forests intended for planting with cinchona will be exploited to the fullest extent for all saleable timber and then handed over to the Cinchona department for clearfelling and planting with cinchona. Sholas which are to be maintained as such will be subjected only to light selection fellings of mature and overmature saleable timber, and their regeneration will be attempted by underplanting suitable species under top canopy conditions.

290. *Fuel forests.*—Fuel forests will be exploited under the system of "simple coppice" and regenerated in combination with "ponam."

291. *Bamboos.*—Bamboo coupes will be offered for sale on a felling cycle of three years, under proper felling rules.

292. *Sandalwood and minor produce.*—The practice of shifting cultivation on the Pundi-Mavadap plateau will be made use of in providing agricultural implements for the plains villages and for the regeneration of sandalwood.

293. *Grazing.*—Ordinary grazing and penning and improvement to watering facilities will be provided for. Rotational grazing will be initiated by opening closed fuel coupes for restricted grazing for a limited number of cattle as soon as regeneration is free from danger.

SECTION 3.—WORKING CIRCLES AND THEIR CONSTITUTION.

294. *The working circles.*—The objects of management will be attained by the formation of the following eight working circles :—

(1) The Conversion Working Circle.
(2) The Deciduous Selection Working Circle.
(3) The Evergreen Selection Working Circle.
(4) The Fuel Working Circle.
(5) The Bamboo Working Circle.
(6) The Minor Forest Produce Working Circle.
(7) The Grazing Working Circle.
(8) The Protection Working Circle.

295. *The Conversion Working Circle.*—The Conversion Working Circle includes all areas in the division suitable for conversion into plantations mainly of teak. The total

area included in this working circle is 17,904 acres. There will be two felling series—the Mount Stuart felling series of 16,112 acres and the Punachi felling series of 1,792 acres.

296. *The Deciduous Selection Working Circle.*—The Deciduous Selection Working Circle covers the deciduous timber forests of Tunacadavu and Pollachi ranges not suitable for conversion into plantations by clearfelling and concentrated regeneration. Its area is 12,768 acres. There will be three felling series—the Tunacadavu felling series of 6,335 acres, the Ulandi felling series of 5,933 acres and the Villoni felling series of 500 acres.

297. *The Evergreen Selection Working Circle.*—The Evergreen Selection Working Circle covers those shola forests of the division which are to be maintained as such, for the time being or perpetually, with a view to the conservation of water-supply and other climatic factors. Its area is 6,945 acres. Two felling series will be constituted—the Karianshola felling series of 2,060 acres and the Kalar felling series of 4,885 acres.

298. *The Fuel Working Circle.*—The Fuel Working Circle extends over the Pollachi and Udumalpet ranges and covers the accessible outer slopes of the hills suitable for the exploitation of firewood. The total extent of the working circle is 20,775 acres, distributed over twelve felling series as shown below :—

Range.	Name of series.	Area in acres.
Pollachi	Pothamadai	959
Do.	Keerapadi	570
Do.	Gudaravalli	986
Do.	Ayerangal	1,175
Do.	Pachathanni	1,049
Do.	Kottur	1,736
Do.	Nallar	1,221
Udumalpet	Dhali	2,608
Do.	Kamanuthu	3,461
Do.	Chinnar	3,085
Do.	Amaravathi	2,522
Do.	Navalodai	1,403

299. *The Bamboo Working Circle.*—The Bamboo Working Circle covers all the bamboo bearing areas of the division which can be profitably exploited by contractors. Its total area is 80,993 acres and it is distributed over fourteen felling series, one in Punachi range, three in Tunacadavu range, four in Udumalpet range and six in Pollachi range.

300. *The Minor Forest Produce Working Circle.*—The Minor Forest Produce Working Circle includes the whole area covered by the working plan.

301. *The Grazing Working Circle.*—The Grazing Working Circle covers the whole of the Pollachi and Udumalpet ranges, and the Torakadavu block, and compartment 1 of the Punachi felling series of the Punachi range with the exception of fuel coupes closed to cattle following exploitation and regeneration. The rest of the Punachi range and the whole of the Tunacadavu range are not open to grazing.

302. *The Protection Working Circle.*—Areas not included in the Conversion, Deciduous Selection, Evergreen Selection, Fuel or Bamboo Working Circles fall under the "Protection Working Circle." Its total area is 140,020 acres or 218·8 square miles.

SECTION 4.—PERIOD OF THE WORKING PLAN.

303. *Period of the plan.*—This working plan will be in force for the period 1941–42 to 1950–51, both inclusive.

304. *Next revision.*—Its revision should be taken up in 1949 so that the revised working plan report may be completed well before the expiry of the present working plan. The programme of fellings, thinnings, etc., and the control forms have, however, been prepared for the next fifteen years in case there be any difficulty in taking up the next revision in time.

CHAPTER II.—WORKING PLAN FOR THE CONVERSION WORKING CIRCLE.

SECTION 1.—GENERAL CONSTITUTION OF THE WORKING CIRCLE AND CHARACTER OF THE VEGETATION.

305. *General constitution.*—The Conversion Working Circle consists of all localities in the Mount Stuart, Tekkadi, Ulandi and Palakadavu blocks, and in the old Punachi Working Circle, suitable for conversion into plantations, primarily of teak. All areas

already clearfelled and planted are also included in this working circle. The working circle includes Mr. Laurie's Clearfelling Working Circle and Mr. Sarma's Plantation Working Circle. Mr. Laurie's Clearfelling Working Circle has been expanded by the inclusion of parts of his Selection Working Circle suitable for forming teak plantations of, perhaps a somewhat lower quality in places. Mr. Laurie had taken in only the very best localities into his Conversion Working Circle, and had relegated doubtful areas and those containing no teak, to the Selection Working Circle, considering that the problem of successful regeneration of teak in a selection forest still awaits a satisfactory solution, it is considered preferable to ensure a teak plantation of even a somewhat low quality to depending on chance for teak regeneration in a selection forest. Small suitable areas occurring along the base of the Vengoli ridge have been included in this working circle though they were originally allotted to the Selection Working Circle. Swamps, existing or potential, have been rigorously excluded.

Areas unsuitable for clearfelling and planting have been excluded from Mr. Sarma's Plantation Working Circle and the balance absorbed into this circle.

306. *Character of the vegetation.*—The type of vegetation met with has been described in detail in Chapter II of Part I.

In the Tunacadavu range, the vegetation is of a mixed deciduous type with large quantities of bamboo (*Bambusa arundinacea*) scattered throughout. The chief species are *Tectona grandis*, *Dalbergia latifolia*, *Terminalia tomentosa*, *Terminalia paniculata*, *Lagerstrœmia lanceolata*, *Pterocarpus marsupium*, *Grewia tiliæfolia*, *Xylia xylocarpa*, *Anogeissus latifolia* and *Dillenia pentagyna*. The height growth is good. Lantana is general and comes up densely in any clearing.

In the Punachi range, the quality of the vegetation is distinctly lower, as is indicated by the poorer height growth. There is a higher proportion of *Anogeissus latifolia* and some *Shorea talura* occurs on the eastern extremity. The undergrowth has a tendency to become evergreen in sheltered places. Lantana forms an impenetrable undergrowth.

SECTION 2.—DIVISION OF THE AREA.

307. *Area.*—The total area of the Conversion Working Circle is 17,904 acres.

3 8. *Felling series.*—The working circle is divided into two felling series—the Mount Stuart felling series in the Tunacadavu range and the Punachi felling series in the Punachi range.

309. *The Mount Stuart Felling Series.*—The Mount Stuart Felling Series consists of all existing plantations in the Mount Stuart and Ulandi Felling Series of Mr. Laurie's Clearfelling Working Circle and all areas in Mount Stuart, Tekkadi, Palakadavu and Ulandi blocks now considered suitable for clearfelling and planting with teak. Such suitable areas have been indicated on the management maps. The total area of the felling series is 16,112 acres composed of 3,177 acres of existing plantations and of 12,935 acres judged as suitable for conversion into plantations of teak.

The various plantations are listed below with their areas, years of formation and their allotment to All-India Quality classes :—

Teak plantations—Tunacadavu Range.

Serial number and year of formation.		Gross area in acres.	Net area excluding failures and swamps in acres.	Remarks.
1 Waterfall	1872	6·0	6·0	
2 Karian shola	1890	6·0	6·0	
3 Do.	1900	2·0	2·0	
4 Mount Stuart	1916	7·0	6·5	
5 Do.	1919	26·0	26·0	
6 Do.	1921	37·51	24·8	
7 Do.	1922	105·35	96·1	
8 Do.	1923	137·96	131·5	
9 Do.	1924	272·27	254·5	
10 Do.	1925	236·80	183·0	
11 Do.	1926	267·20	201·0	
12 Do.	1927	146·37	53·6	
13 Do.	1928	127·53	42·0	
14 Do.	1929	143·51	103·3	
15 Do.	1930	241·78	134·0	
16 Do.	1931	103·00	85·5	
17 Do.	1932	92·30	79·7	
18 Do.	1933	48·80	21·6	
19 Do.	1934	92·0	80·5	
20 P. S. Plantation	1934	4·0	4·0	Near 18/7th mile on the Mount Stuart Road.

Teak plantations—Tunacadavu Range—cont.

Serial number and year of formation.		Gross area in acres.	Net area excluding failures and swamps in acres.	Remarks.
21 Mount Stuart	1935	91	87·3	Correct net area will be available when these plantations are stock-mapped for quality classes.
22 Topslip Bungalow plantation	1935	5·0	5·0	
23 Mount Stuart	1936	87·0	87·0	
24 Topslip Bungalow plantation	1936	5·0	5·0	
25 Do.	1937	5·0	5·0	
26 Mount Stuart	1937	88·0	88·0	
27 Do.	1938	87·0	87·0	
28 Do.	1939	87·0	87·0	
29 Do.	1940	183·0	183·0	
30 Ulandi	1932	58·4	50·5	
31 Do.	1933	52·5	41·0	
32 Do.	1934	52·4	43·8	
33 Do.	1935	55·6	47·2	
34 Do.	1936	55·0	55·0	Correct net area will be available when these plantations are stock-mapped for quality classes.
35 Do.	1937	50·2	50·2	
36 Do.	1938	55·5	55·5	
37 Do.	1939	56·0	56·0	
		3,176·98	**2,578·1**	

Statement showing the distribution of All-India Quality classes in the Teak Plantations—Tunacadavu Range.

Year of formation.	Gross area of the plantation.	Quality class in acres.						Blank and swamps.	Net area of the plantation in acres.
		I	II	III	IV	V	Below V.		
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Mount Stuart—									
1872	6·0	..	1·5	4·5	..	..	..	..	6·0
1890	6·0	..	..	..	6·0	..	..	..	6·0
1916	7·0	..	0·90	3·60	2·00	..	..	0·5	6·50
1919	29·95	..	0·50	7·50	16·00	2·00	..	3·95	26·00
1921	37·51	..	0·20	6·80	14·50	3·30	..	12·71	24·80
1922	105·35	..	2·50	40·20	35·00	14·00	4·40	9·25	96·10
1923	137·96	..	0·30	38·66	63·00	36·00	..	..	137·96
1924	272·27	..	1·20	83·00	135·00	30·00	3·80	19·27	253·00
1925	236·80	..	..	63·00	102·00	18·00	..	53·80	183·00
1926	267·00	..	..	11·60	160·00	29·40	..	66·00	201·00
1927	146·37	..	..	19·00	30·00	4·60	..	92·77	53·60
1928	127·53	..	..	0·90	14·00	26·40	0·80	85·43	42·10
1929	143·51	..	..	30·00	56·30	17·00	..	40·21	103·30
1930	241·78	..	0·20	48·30	68·50	17·00	..	107·78	134·00
1931	103·00	..	9·60	50·40	24·00	1·50	..	17·50	85·50
1932	92·30	..	..	12·70	29·00	36·00	2·00	12·60	79·70
1933	48·80	..	..	13·80	6·40	1·40	..	27·20	21·60
1934	92·00	0·50	9·50	40·50	26·50	3·50	..	11·50	80·50
1935	91·00	..	..	3·30	47·00	32·50	4·50	3·70	87·30
Ulandi—									
1932	58·40	0·30	8·20	28·00	12·00	2·00	..	7·90	50·50
1933	52·50	..	5·60	19·60	15·60	0·20	..	11·50	41·00
1934	52·40	0·30	17·30	20·00	6·20	..	..	8·60	43·80
1935	55·60	..	1·20	19·00	23·70	1·30	2·00	8·40	47·20
	2,411·03	**1·10**	**58·70**	**564·36**	**892·70**	**276·1**	**17·50**	**600·57**	**1,810·46**

310. *The Punachi Felling Series.*—The Punachi Felling Series is composed of all existing plantations in Mr. Sarma's plantation working circle and all areas in the old Punachi working circle considered fit for clearfelling and planting with teak. The areas fit for planting have been marked on the management map. The total area of the series is 1,792 acres, composed of 164 acres of existing plantations, the balance being the area judged as suitable for conversion into similar plantations. The existing plantations are shown below :—

Punachi Teak Plantations.

Serial number.	Years of formation.	Gross area in acres.	Net area excluding failures and swamps in acres.	Remarks.
1	Punachi, 1922–24	41·2	33·0	Correct net area will be available when these plantations are stock-mapped for quality classes.
2	1936	27·0	27·0	
3	1937	22·9	22·9	
4	1938	21·8	21·8	
5	1939	27·5	27·5	
6	1940	24·0	24·0	
		164·4	**156·2**	

Statement showing distribution of All-India Quality classes in the Teak Plantations—Punachi Range.

Year of formation.	Gross area of the plantation.	Quality class in acres							Net area of the plantation in acres.
		I.	II.	III.	IV.	V.	Below V.	Blanks and swamps.	
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
1922–1924	42·00	..	..	0·40	6·20	19·00	4·00	·12.40	29·60

311. *Blocks.*—The Tunacadavu range forests have been divided conveniently into the Mount Stuart, Tekkadi, Ulandi and Palakadavu blocks. The old Punachi working circle will now be designated the Punachi block, including a small extent of 30 acres now added to it.

312. *Compartments.*—The forests in the Tunacadavu range were divided by Mr. Laurie into 102 permanent compartments for purposes of location, management and description. Their boundaries are, as far as possible, natural features and they are numbered in Arabic numerals in series. To these have now been added compartments 103 to 105 in the Palakadavu valley.

The area covered by the Punachi felling series of the Conversion working circle forms the major part of the old Punachi working circle which was originally divided into 20 compartments. These compartments will continue to retain their identity but have been subdivided suitably so as to mark off areas considered unfit for clearfelling and planting with teak. A small area adjoining compartment 20 has now been added and designated as compartment 20 (*a*) (area 30 acres).

313. *Allotment of compartments to working circles.*—The subjoined statements exhibit compartments or parts of compartments falling under each working circle, and the total extent of each compartment—

Mount Stuart and Tekkadi Blocks—Tunacadavu Range.

Compartment number.	Conversion working circle excluding plantations.	Deciduous Selection working circle.	Evergreen Selection working circle.	Plantations up to 1940.	Unworkable area.	Total area of the compartment.
(1)	(2)	(3)	(4)	(5)	(6)	(7)
	ACS.	ACS.	ACS.	ACS.	ACS.	ACS.
1	139·0	45·0	..	..	29·25	213·25
2	190·0	31·69	..	..	..	221·69
3	218·0	'36·22	..	..	..	254·22
4	80·0	163·0	..	..	47·58	290·58
5	55·0	96·0	..	..	263·91	414·91
6	225·0	33·0	..	..	88·31	346·31
7	224·0	35·0	..	..	40·11	299·11
8	99·0	24·0	7·82	..	238·87	369·69
9	255·0	52·2	..	..	..	307·20
10	116·0	52·0	49·61	..	2·74	220·35
11	206·0	29·91	..	..	..	235·91
12	125·0	56·17	..	..	..	181·17
13	218·0	72·57	..	..	..	290·57
14	239·0	114·25	18·76	..	..	372·01
15	61·0	211·44	108·71	..	..	381·15
16	60·0	195·47	..	..	..	255·47
17	312·0	36·78	..	..	..	348·78
18	100·0	95·20	..	..	..	195·20
19	195·0	86·33	..	..	..	281·33
20	263·0	75·49	..	..	..	338·49
21	233·0	22·02	..	..	..	255·02
22	183·0	54·6	..	..	..	237.6
23	207·0	105·80	..	..	..	312·80
24	126·0	56·50	..	..	..	182·50
25	150·0	61·20	..	..	..	211·20
26	215·0	65·27	..	..	..	280·27
27	210·0	40·15	..	..	43·0	293·15
28	197·0	76·95	..	..	..	273·95
29	183·0	53·28	..	2·03	..	238·31
30	190·0	78·0	..	..	..	268·0
31	356·0	43·02	..	..	..	399·02
32	269·0	46·11	..	..	..	315·11
33	217·0	40·15	..	..	..	257·15
34	127·0	178·0	..	..	51·26	356·26
35	117·0	96·0	..	..	85·40	298·40
36	108·5	134·0	..	51·5	48·22	342·22
37	71·0	242·03	..	191·0	122·02	626·05
38	182·5	101·87	..	19·63	..	304·00
39	7·0	6·07	..	376·7	..	389·77
40	32·2	12·06	..	175·38	..	219·64
41	429·0	18·37	..	4·36	..	451·73
42	..	8·53	..	137·96	..	146·49
43	14·0	9·28	..	506·85	..	530·13
44	..	0·98	0.44	254·84	..	256·26

Mount Stuart and Tekkadi Blocks—Tunacadavu Range—cont.

Compartment number. (1)	Conversion working circle excluding plantations. (2)	Deciduous selection working circle. (3)	Evergreen selection working circle. (4)	Plantations up to 1940. (5)	Unworkable area. (6)	Total area of the compartment. (7)
	ACS.	ACS.	ACS.	ACS.	ACS.	ACS.
45	158·0	166·0	25·42	8·0	..	357·42
46	160·0	146·4	..	..	..	306·40
47	83·0	153·8	..	..	..	236·80
48	..	100·06	..	5·0	..	105·06
49	24·0	192·81	30·75	..	..	247·56
50	9·0	104·87	133·68	..	..	247·55
51	..	247·02	72·0	..	..	319·02
52	16·0	180·0	..	24·0	72·27	292·27
53	..	40·36	..	206·13	..	246·49
54	..	..	263·47	..	..	263·47
55	..	..	195·29	..	26·93	222·22
56	..	..	227·38	..	..	227·38
57	..	..	184·0	..	216·89	400·89
58	..	54·22	121·5	..	29·26	204·98
59	..	163·11	25·24	..	174·04	362·39
60	..	..	206·58	..	..	206·58
61	..	89·0	54·31	75·53	..	218·84
62	..	63·91	20·80	70·84	..	155·55
63	..	15·80	200·18	9·0	..	224·98
64	..	216·18	..	29·78	16·98	262·94
65	44·7	125·12	..	58·45	10·84	239·11
66	99·0	105·35	21·25	17·60	..	243·20
67	..	56·49	88·69	2·0	..	147·18
68	49·0	85·04	3·73	1·42	..	139·19
69	2·0	83·07	..	67·82	..	152·89
70	85·0	40·0	..	2·89	56·07	183·96
71	25·0	86·0	..	54·31	38·77	204·08
72	..	59·73	..	122·40	..	182·13
73	..	135·46	..	81·51	..	216·97
74	58·7	52·0	..	92·30	32·2	235·20
75	77·14	142·0	..	92·15	59·61	370·90
76	..	194·0	..	..	54·0	248·0*
77	..	130·0	..	..	121·0	251·0
78	..	6·0	..	..	216·6	222·6
79	..	10·0	..	..	488·30	498·30
80	..	..	..	..	714·4	714·40
Palakadavu and Ulandi blocks.						
81	108·00	398·4	71·2	..	..	577·6
82	130·00	421·2	8·8	..	..	560·0
83	60·00	548·8	44·0	..	..	652·8
84	438·00	76·4	..	..	..	514·4
85	385·00	74·2	..	..	..	459·2
86	352·00	103·2	..	..	..	455·2
87	204·00	238·4	..	..	..	442·4
88	327·00	184·2	..	..	..	511·2
89	314·00	322·8	..	..	..	636·8
90	395·00	271·4	..	..	..	666·4
91	..	334·0	262·0	..	..	596·0
92	147·8	320·2	..	64·0	..	532·0
93	40·0	415·6	..	82·0	..	537·6
94	344·8	263·0	..	17·0	..	624·8
95	93·0	406·6	69·2	..	..	568·8
96	72·0	110·7	6·3	215·0	..	404·0
97	..	604·0	..	..	..	604·0
98	353·4	73·8	..	57·6	..	484·8
99	162·0	388·4	..	..	195·2	745·6
100	123·0	362·6	40·4	..	94·0	620·0
101	..	15·6	..	..	776·4	792·0
102	..	..	..	..	528·0	528·0
103	39·0	..	..	..	499·0	538·0
104	241·0	..	..	..	641·0	882·0
105	511·0	..	..	..	310·0	821·0
	12,934·74	**12,269·26**	**2,561·51**	**3,176·98**	**6,432·43**	**37,374·92**

Punachi Block—Punachi Range.

Compartment number. (1)	Conversion working circle excluding plantations. (2)	Plantations. (3)	Protection working circle. (4)	Total area of the compartment. (5)
	ACS.	ACS.	ACS.	ACS.
1	..	..	146·8	146·8
2	..	..	194·8	194·8
3	109·1	..	21·2	130·3
4	56·5	..	4·0	60·5
5	27·0	58·2	7·2	92·40
6	152·0	..	22·06	174·06
7	79·0	..	18·60	97·60

* Mr. Laurie's figure was short by 100 acres.

Punachi Block—Punachi Range—**cont.**

Compartment number.	Conversion working circle excluding plantations.	Plantations.	Protection working circle.	Total area of the compartment.
(1)	(2)	(3)	(4)	(5)
	ACS.	ACS.	ACS.	ACS.
8	29·3	51·5	..	80·80
9	99·5	13·5	20·2	133·2
10	46·0	..	52·4	98·4
11	103·2	..	..	103·2
12	124·5	..	..	124·5
13	73·0	..	9·5	82·5
14	26·55	41·2	..	67·75
15	82·25	..	..	82·25
16	20·0	..	238·1	258·1
17	..	..	..	..
18	338·1	..	43·6	381·74
19	125·6	..	37·6	163·2
20	106·0	..	34·5	140·5
20-A	30·0	..	..	30·0
	1,627·6	164·4	850·6	2,642·6

SECTION 3.—ANALYSIS AND VALUATION OF THE CROP.

314. *Stock-mapping areas suitable for teak planting.*—Areas considered suitable for clearfelling and planting with teak were judged with reference to the quality and composition of the standing crop, slope of the terrain and drainage. The presence of teak or *Lagerstrœmia lanceolata* of good height growth or of mixed *Terminalia tomentosa* forest of good quality, or a mixed forest with well-grown bamboo, was considered to indicate suitability for teak. A high proportion of *Terminalia tomentosa, Shorea talura, Anogeissus latifolia, Randia uliginosa, Butea frondosa or Xylia xylocarpa* was considered unsuitable. Steep slopes, poorly drained areas, swamps (patent or potential), localities infested with tall, coarse grass, a decidedly evergreen type of growth and areas supporting stunted trees were excluded. The standard of selection in the Punachi Block was distinctly lower since the locality is generally of a considerably lower quality.

315. *Preparation of suitability maps.*—The total extent of forest suitable for planting with teak was ascertained from stockmaps prepared as indicated in the preceding paragraph and the annual planting areas were determined by dividing the total area by the probable rotation. The area required for planting in the Tunacadavu range for the next fifteen years was then carefully inspected and stockmapped in retail on Mr. Laurie's 12 inches maps, exhibiting areas suitable or unsuitable for clearfelling and planting. No such detailed stockmap was considered necessary for the Punachi range on account of the poorer quality of the locality and since the annual planting area is only 25 acres.

SECTION 4.—METHOD OF TREATMENT.

316. *Silvicultural system.*—The object of management is the conversion of the existing relatively less valuable stock into plantations of more valuable species, the realization of revenue consequent on such conversion and the harvesting of mature and overmature saleable trees, if any, over areas not destined for clearfelling within a reasonable period. The silvicultural system which will secure this object is "clearfelling" followed by concentrated artificial regeneration, combined with a cycle of subsidiary fellings, where required. This system has been followed regularly from 1931–32 in Tunacadavu and from 1935–36 in Punachi and will be continued. There will be no subsidiary fellings in Punachi range, however, since the forests have been heavily exploited in the past, under selection fellings.

317. *Exploitable size.*—Any size which is saleable at a profit will be extracted from the clearfelled areas. Topends of valuable species, like teak and rosewood are marketable. In the case of subsidiary fellings, the minimum exploitable girth of 7½ feet at breast height, over bark, fixed by Mr. Laurie, will be continued.

318. *Choice of species.*—Teak will be the primary species to be used for regenerating the clearfelled areas in both the felling series. Areas of small extent within the clearfelled coupe which are not suitable for teak will be planted with *Dalbergia latifolia* (or *Dalbergia sissoides*) if the District Forest Officer considers that this species is likely to grow well in such areas.

In the Punachi felling series, teak is of a poor quality and the future value of the plantations is not likely to be high. It is therefore desirable to have a subsidiary species which will augment the value of these plantations. Sandal (*Santalum album*) has already invaded some of the older plantations and appears to be well-suited to the locality. It will also help to cover the ground when the teak is subjected to thinnings. Sandal is growing in various places in the Presidency in mixture with teak without visible harmful effects on the latter. It will therefore be introduced in mixture with the teak as a subsidiary species in the Punachi teak plantations. It will add considerably to the future money value of these plantations.

319. *Rotation.*—A rotation of 100 years was fixed tentatively by Mr. Laurie for calculating the yield and size of the average annual coupe for the conversion of the Mount Stuart forests into teak plantations. Mr. Wood's ring countings had shown that natural teak in Mount Stuart forests attained a girth of 5 feet 3 inches in a hundred years. Plantation teak is known to grow faster than natural teak. It was consequently considered justifiable to assume that an average girth of six feet over bark at breast height would be attained in a hundred years by plantation teak in Tunacadavu range.

With a view to compare growth trends of teak in Tunacaduvu range with the All-India yield tables, sample plots were laid out in all plantations formed from 1916 to 1935, and in an 1890 plantation, and the diameters of dominant and sub-dominant trees in them were measured. Details will be found in Chapter VI of Part I. The curves drawn from these data show that the crop diameters of Tunacadavu plantations are considerably in excess of those derived from the All-India curves, indicating a decidedly faster girth increment, quality for quality, compared with All-India averages up to 25 years of age. Owing to scarcity of data, it is not possible to assert that a faster rate of growth will continue to be maintained after this age, but there is nothing to indicate the contrary. It is, therefore, very likely that an average breast hight girth of six feet over bark will be attained by the Tunacadavu plantation teak in less than a hundred years—perhaps in eighty years; but it is not essential to arrive at a final decision now in the matter of the correct rotation for these plantations.

The principles of sound management require, however, that a forest should be brought into a state of full production as soon as practicable, without prejudice to economic and other related factors. The rate of conversion of a mixed deciduous forest into more valuable teak plantations may therefore be accelerated to a degree that can be dealt with economically year after year, both in the matter of disposal of the outturn from fellings and of the successful regeneration of the felled area. The total area of the Mount Stuart felling series is 16,549 acres and a conversion period of 80 years will give an area of about 200 acres for annual clearfelling and regeneration, which is within the capacity of the market for absorption of the outturn and of the labour force for regeneration. A rotation of eighty years will therefore be adopted for the present. If any change is considered necessary at the time of the next revision of the working plan in the light of data then available, it can be effected then without upsetting the general framework of this plan.

320. *Periodic Blocks.*—A period of conversion of 80 years has been adopted tentatively in the previous paragraph above in order that the extent of the annual conversion area may be arrived at. This conversion period of 80 years will be divided into eight periods of ten years each, and one periodic block will be regenerated in each such period.

The total area of the Mount Stuart felling series is 16,112 acres, so that the area of a periodic block in this series is 2,014 acres.

The area of the Punachi felling series is 1,792 acres, which makes that of a periodic block 224 acres for this series.

321. *Allotment to Periodic Blocks.*—The total extent of plantations formed in Mount Stuart felling series up to and including 1940 is 3,177 acres. These plantations thus constitute Periodic Block I and half of Periodic Block II. The other half of Periodic Block II and the whole of Periodic Block III have been allotted for conversion in the next fifteen years.

The plantations in Punachi series cover an extent of 164 acres of part of Periodic Block I. The rest of Periodic Block I and part of Periodic Block II have been allotted for conversion in the next 15 years.

322. *Regulation of yield.*—The yield will be regulated by area both for the clearfellings and for the subsidiary fellings. Coupes of approximately equal extent, as marked on the maps, will be clearfelled every year with the object of securing an even series of age gradations at the end of the period of conversion. The subsidiary coupes will also be approximately equal to one another in extent.

323. *Areas of clearfelling coupes.*—The area of the Mount Stuart Felling Series is 16,112 acres. The conversion period adopted being 80 years, the area of the annual coupe should be about 201·4 acres. Allowing for possible errors in stockmapping, the area of the annual coupe has been fixed at 200 acres for this series.

For the Punachi felling series of 1,792 acres, the annual coupe works out to 22·4 acres, on the same rotation. An area of 25 acres will continue to be clearfelled and planted every year, however, as at present.

324. *Gross and net areas of clearfelling coupes.*—The suitability map for the Mount Stuart series indicates areas within a coupe unsuitable for clearfelling and planting with teak on various grounds, such as swampy or rocky conditions, stunted nature of the growth and the like. Such areas will not be subjected to clearfelling but will be exploited under the prescriptions of the deciduous selection working circle, as part of the selection coupe of that year. The natural forest thus left in patches inside teak plantations will afford refuge for the alternate hosts of the parasites on the teak defoliators *Hyblœa* and *Hapalia* and will therefore help to keep the defoliator population at a low level.

The gross areas of clearfelling coupes have been adjusted as necessary so as to give equal net areas for annual clearfelling and planting.

The subjoined statement gives the gross and net areas of clearfelling coupes in Mount Stuart series :—

Felling statement of clear-felling coupes areas—Mount Stuart Series.

Years of felling.	Coupe number.	Gross area of the coupe in acres.	Selection area included in the coupe.	Net area of the coupe in acres.
			ACS.	
1941–42	I	251·0	51·0	200·0
1942–43	II	232·0	34·0	198·0
1943–44	III	224·0	25·0	199·0
1944–45	IV	223·0	24·0	199·0
1945–46	V	228·0	28·0	200·0
1946–47	VI	198·0	..	198·0
1947–48	VII	215·0	16·0	199·0
1948–49	VIII	223·0	22·0	201·0
1949–50	IX	288·0	88·0	200·0
1950–51	X	220·0	19·0	201·0
1951–52	XI	271·0	68·0	203·0
1952–53	XII	247·0	50·0	197·0
1953–54	XIII	297·0	98·0	199·0
1954–55	XIV	270·0	68·0	202·0
1955–56	XV	283·0	83·0	200·0

The suitability map for the Punachi series was prepared on a scale of 4 inches to the mile and consequently the unsuitable areas could not be shown in as great detail as in the case of the 12-inch maps for the Mount Stuart series. The gross and net areas of coupes in this series are shown below :—

Felling statement of clear-felling coupes areas—Punachi Series.

Year of felling.	Coupe number.	Net area of the coupe in acres.	Area under protection.	Gross area of the coupe in acres.
			ACS.	
1941–42	VII	25	..	25
1942–43	VIII	25	..	25
1943–44	IX	25	..	25
1944–45	X	25	5·2	30·2
1945–46	XI	26	19·6	45·6
1946–47	XII	25	5·2	30·2
1947–48	XIII	25	6·6	31·6
1948–49	XIV	26	..	26
1949–50	XV	28	10·5	38·5
1950–51	XVI	25	4·3	29·3
1951–52	XVII	23	..	23
1952–53	XVIII	31	..	31
1953–54	XIX	28	..	28
1954–55	XX	28	..	28
1955–56	XXI	31	..	31

325. *Cycle for subsidiary fellings.*—The felling cycle for subsidiary fellings in Mount Stuart Series will be fixed at twenty years, the period of regeneration of two periodic blocks.

There will be no subsidiary fellings in the Punachi Felling Series since the forests in this series, have been subjected to systematic over-exploitation in the past in the name of " Selection fellings."

326. *Areas of subsidiary coupes, Mount Stuart Series.*—The total area of the felling series is 16,112 acres. Of this, 3,177 acres have been converted into plantations, 5,664 acres have been exploited under selection fellings and 877 acres exploited under subsidiary fellings within the past ten years, leaving a balance of 6,394 acres. Areas which will come under conversion in the next twenty years (two periodic blocks) will not be subjected to subsidiary fellings in the current felling cycle, so that an extent of 4,028 acres (two periodic blocks) has to be deducted from 6,394 acres on this account, leaving an area of 2,366 acres for subsidiary fellings during the current cycle. The felling cycle adopted being twenty years, the average annual subsidiary coupe will cover an area of 119 acres.

327. *Location of subsidiary coupes.*—The subsidiary coupes and their order of exploitation have been indicated on the maps. The coupes have been located, as far as possible, so as to adjoin selection coupes of the same year in order to concentrate work. In some cases selection areas are included in the subsidiary coupe when they will be both exploited at the same time.

Statement of subsidiary fellings showing Conversion of Working Circle—Tunacadavu.

Year of felling.	Coupe number.	Subsidiary area in selection coupe.	Separate subsidiary coupe.	Total area of subsidiary coupe.
		ACS.	ACS.	ACS.
1941–42	I (a, b) ..	..	134	134
1942–43	II ..	..	135	135
1943–44	III ..	..	140	140
1944–45	IV (a, b) ..	..	152	152
1945–46	V ..	..	128	128
1946–47	VI ..	..	138	138
1947–48	VII ..	..	131	131
1948–49	VIII (a, b) ..	..	148	148
1949–50	IX ..	..	140	140
1950–51	X (a, b) ..	42	98	140
1951–52	XI ..	..	136	136
1952–53	XII ..	..	138	138
1953–54	XIII ..	..	138	138
1954–55	XIV ..	..	139	139
1955–56	XV (a, b) ..	12	123	135

Note.—The suffixes (a) and (b) indicate separate bits of the same coupe.

328. *Estimate of yield from clearfellings.*—An estimate of probable yield from each coupe has been made on the basis of Mr. Laurie's enumeration figures. His enumeration data were analysed and the number of trees above 3 feet girth within the coupe was ascertained for each species and classified in girth classes. Where areas have been included which have undergone selection or subsidiary fellings, trees above a breast height girth of 7½ feet were excluded from the calculations. Selection areas included in the coupe but which will come under fellings simultaneously with the clearfelling, were completely excluded from these calculations. The estimated outturn was then calculated with reference to the new outturn tables mentioned in paragraph 281. A comparison of the estimated and actual outturn in the past reveals, however, that only in the case of teak is there reasonable agreement between the estimated and the actuals, taking the average outturn from past fellings. In the case of rosewood, the actuals were only from 25 to 36 per cent of the estimates, or 30 per cent, on an average. For other species, the actuals were from 31 to 50 per cent, or about 40 per cent on an average.

The estimate of yield given in the statement under the next paragraph may therefore be taken as reasonably close in the case of teak only. A reduction to 30 per cent for rosewood and 40 per cent for other species, is likely to give a closer agreement with actuals.

329. *Statement of probable yield from clearfellings.*—The subjoined statement gives the probable yield from clearfelling coupes as calculated according to the new outturn tables. The reductions that may be necessary have been indicated in the preceding paragraph.

Statement of estimated yield of timber from the clearfelling coupes—Tunacadavu Range.

Year of felling.	Coupe number.	Estimated yield in cubic feet. Teak.	Dalbergia latifolia.	Terminalia paniculata.	Terminalia tomentosa.	Lagerstroemea lanceolata.	Grewia tiliaefolia.	Total.
1941–42	I	42,536	3,884	14,958	12,639	5,409	13,900	93,326
1942–43	II	42,803	4,013	20,759	12,125	8,507	20,011	108,218
1943–44	III	52,128	3,172	15,254	6,166	8,694	20,372	105,786
1944–45	IV	58,983	2,786	23,776	11,145	14,527	35,151	146,368
1945–46	V	33,128	3,567	28,355	19,610	8,656	14,696	108,012
1946–47	VI	16,797	4,875	35,155	10,740	19,626	30,937	118,130
1947–48	VII	42,994	4,650	31,262	18,564	22,697	29,952	150,119
1948–49	VIII	55,210	4,150	25,526	14,435	20,314	23,184	142,819
1949–50	IX	44,004	3,840	17,497	13,278	17,189	30,101	125,909
1950–51	X	41,474	4,133	28,287	15,415	27,422	36,095	152,826
1951–52	XI	49,085	2,023	22,723	22,242	19,853	24,620	140,546
1952–53	XII	76,407	1,835	14,233	15,785	28,674	22,739	159,673
1953–54	XIII	33,750	1,430	10,367	11,390	13,016	19,192	89,145
1954–55	XIV	18,360	3,632	14,449	8,864	7,821	21,429	74,555
1955–56	XV	28,972	1,451	10,345	8,323	11,382	14,702	75,175

Note.—An area of 9·5 acres in Coupe II and 3 acres in Coupe VI were not enumerated by Mr. Laurie and consequently the yields from them have not been calculated. The reduced yields in coupes XIII to XV is due to their having been partly exploited under selection and subsidiary fellings between 1934 and 1938.

330. *Estimate of yield from subsidiary fellings.*—An estimate of yield from subsidiary fellings has been made for each coupe on lines similar to those followed for the clearfelling coupes. The number of trees above a breast height girth of 7½ feet over bark was ascertained for each species and the outturn was calculated according to the new tables. Past actuals from subsidiary fellings could not be compared with the estimates, since the annual extent of the felling areas were not fixed. On the basis of actuals from past selection fellings (which followed the same rules as subsidiary fellings) however, it was noticed that for teak and rosewood the actuals were, on the average, sufficiently close to the estimates, whereas for other species the actuals were but 20 to 40 per cent of the estimates, averaging 33 per cent. The figures in the statement under the next paragraph are therefore likely to be close enough to the actuals for teak and rosewood, while for other species a reduction to 33 per cent is likely to be nearer the actuals.

331. *Statement of yield from subsidiary fellings.*—The subjoined statement gives the yield from subsidiary coupes calculated as described above but without the reductions indicated in it.

Statement of estimated yield of timber from the subsidiary coupes—Tunacadavu Range.

Year of felling.	Coupe number.	Estimated yield in cubic feet. Teak.	Dalbergia latifolia.	Terminalia paniculata.	Terminalia tomentosa	Lagerstroemea lanceolata.	Grewia tiliaefolia.	Total.
1941–42	I	3,041	232	4,522	4,530	1,081	192	13,598
1942–43	II	2,513	298	2,992	6,774	358	144	13,079
1943–44	III	1,592	166	3,126	6,046	33	64	11,331
1944–45	IV	7,600	66	2,462	8,336	179	128	18,771
1945–46	V	2,179	264	1,090	844	258	..	4,635
1946–47	VI	8,534	66	2,158	4,536	79	..	15,373
1947–48	VII	18,167	232	3,590	5,802	258	128	28,177
1948–49	VIII	5,613	100	1,658	2,616	..	..	9,987
1949–50	IX	643	132	860	820	258	..	2,713
1950–51	X	2,036	264	1,426	3,864	..	..	7,590
1951–52	XI	4,230	66	762	1,806	79	400	7,343
1952–53	XII	3,036	366	1,694	1,910	337	336	7,679
1953–54	XIII	1,740	66	332	1,296	100	..	3,534
1954–55	XIV	546	66	..	62	79	..	753
1955–56	XV	648	596	1,290	1,954	474	..	4,962

Note.—In coupes XIV and XV, 133 acres and 36 acres respectively are areas not enumerated by Mr. Laurie and therefore yields have been given only for the balance areas enumerated by him.

SECTION 5.—EXPLOITATION.

332. *Demarcation of coupes.*—The clearfelling and subsidiary coupes indicated on the map will be laid out correctly on the ground, demarcated by cut lines wherever necessary and surveyed accurately, care being taken to measure distances horizontally. The demarcation and survey should be completed well in advance of the marking of saleable trees.

333. *Marking.*—All saleable trees of any girth will be marked for felling in the clearfelling coupes. All saleable trees of 7½ feet breast height girth and over will be marked for felling in the subsidiary coupes. Dead or fallen trees of any size or species will also be marked if saleable at a profit. The trees will be blazed at about four feet from the ground and serial numbers written clearly with tar on the blaze; this number should be chiselled on the base of the tree before felling. The same series of numbers should be continued each year throughout all the coupes in one range in all working circles, irrespective of

species, so as to avoid any possibility of confusion in depot accounts. The girth at breast height (4 feet 6 inches from the ground) will be measured over bark and the total length of saleable logs in the bole will be estimated by eye and the particulars entered in Form 3. An abstract of the enumeration register, arranged in one-foot girth classes for each species, will then be prepared and the estimated volume of the marked trees arrived at with reference to the volume tables given in Chapter VI of Part I. These volume tables based on local conversion practice, have been prepared by the Provincial Silviculturist in revision of Mr. Laurie's provisional volume tables given in Appendix F of his plan. They do not take account of differences in length of utilizable bole so that errors usually made in estimating bole lengths will not influence the results. The volume table for *Grewia tiliæfolia* was prepared by the writer from the results of past fellings as embodied in the felling registers. The District Forest Officer or his assistant should check the marking and the District Forest Officer should satisfy himself that it has been satisfactorily executed; a 10 per cent check is suggested as the minimum.

All creepers and climbers attaching trees to be felled to trees to be left behind will be cut during marking in subsidiary coupes.

Marking and enumeration should be completed normally by July of the year previous to felling and the estimate of yield prepared in August.

334. *Extraction scheme.*—An extraction scheme should be drawn up for each coupe (clearfelling or subsidiary) at the time of marking showing the location of dragpaths, cart-tracks and depots on the large scale (12″ = mile) map. Cart-tracks and dragpaths must be laid out in such a way as will reduce dragging to a minimum. The scheme should be approved by the District Forest Officer.

335. *Felling.*—Felling of saleable species will commence as early as possible after the 1st of April. Trees should be felled with the minimum of waste and the direction of fall should be away from the direction of dragging to facilitate the latter operations.

336. *Logging.*—Logging to the best advantage demands considerable skill and discretion. It must be entrusted to an experienced Ranger or Forester, and checked frequently by the Range Officer, the District Forest Officer and his Assistant. Logging may be done either at stumpsite or at the carting depot, depending on the size of the bole, its straightness and the dragging capacity of the elephant employed. For instance, if a log is within the capacity for dragging of the elephant at work but requires cross-cutting because of its shape, elephant power will be saved by logging it after dragging. Logging should aim at producing reasonably straight logs of high quality, the maximum length being limited by the connected road rules and the means of transport.

337. *Dragholes and snouts.*—All logs of 25 cubic feet and up will have dragholes made as near to the end as possible and will be snouted. Wastage in these operations should be kept down to the absolute minimum.

338. *Squaring or dressing.*—Logs of *Dalbergia latifolia* will normally be dressed round by chipping off all bark and sapwood so as to expose the colour of the heartwood. *Lagerstrœmia lanceolata* is usually offered for sale in the round, with bark on, so as to minimise splitting: the bark will be ringed at the middle of the log to enable the mid-girth to be measured round the wood. Logs of all other species will ordinarily be dressed square, leaving a thin layer of sap at the corners of the square. Teak logs of exceptionally good quality and straightness have a limited demand at Pollachi if offered in the round: it is financially advantageous to satisfy and stimulate this demand.

Exceptionally large logs have sometimes to be sawn longitudinally before they can be transported conveniently.

339. *Numbering of logs.*—All logs will be chisel-numbered on conversion. Letters indicating coupe, species, tree number, log letter, year of felling and quality classification will be chiselled on each log according to current practice.

340. *Extraction.*—All saleable timber should be extracted from the clearfelling area by the end of September, as a rule. Extraction of logs from subsidiary coupes may be continued till the end of March. Logs should be dragged to roadside depots as soon after conversion as possible. Forest depots should be situated under shade, and transport to Pollachi should be done as early as practicable, so as to minimise degrade through exposure. Spokes and felloes should be converted from top ends and waste timber simultaneously with fellings.

341. *Transport.*—The transport of logs to Pollachi depot is usually done on contract on pneumatic tyred carts or motor lorries and no difficulties have been experienced in recent years. The rates are low, the work is rapid, and individual logs of greater length and volume can be transported than by ordinary carts. The wear and tear on roads is also considerably reduced.

342. *Exploitation by contractors.*—The coupes in the Punachi Felling Series are usually sold standing to contractors who clearfell the area and remove the required felled material between April and the end of December. This system may be continued. The marking and enumeration of saleable trees will be carried out, however, as prescribed above since a correct estimate of volume will be very useful in assessing a reasonable sale value for the coupe. If a reasonable value be not offered at any time, the work should be undertaken departmentally.

SECTION 6.—REGENERATION.

343. *Clearing and burning.*—After the completion of the main felling and extraction the District Forest Officer will have discretion to dispose of any residue not required to ensure a good burn. The present system of departmental extraction of spokes and felloes is satisfactory. Clearfelling the regeneration area should then be completed by the middle of December. A fireline should then be cleared and burnt all round the area to a width of not less than 12 feet, care being exercised to prevent the fire from escaping out of the area. The slash should be burnt in February and piling and reburning completed by the middle of March. A good and even burn over the whole area should be aimed at *in the first instance* as piling and reburning are expensive. Logs of large size may be disposed of by placing them along the contours with the help of the elephants used for piling: they will then help to prevent wash without interfering with other operations. Too intense a burn should be avoided as it tends to bake the soil and destroy useful soil bacteria.

Cutting and burning are now being done at Government cost. Efforts should be made to get this work done free by the ponamdars, ultimately, after the system of ponam regeneration has been fully organized.

344. *Lining and staking.*—The espacement will continue to be 6 feet by 6 feet for teak and rosewood. The lining and staking will be done accurately in the manner described in the Madras Forest Packet Book: accuracy in alignment is emphasized in view of the mechanical thinning prescribed below. The length of the stakes need not exceed 18 inches. This operation should ordinarily be completed by the end of March. The espacement for sandal will be 30 feet by 30 feet in the Punachi felling series.

345. *Inspection paths.*—Permanent, properly graded paths six feet wide will be laid out as at present so as to divide the regeneration area into blocks of about 25 acres.

346. *Method of regeneration to be employed.*—The clearfelled areas should be regenerated in combination with field crops (ponam regeneration) as far as may be practicable. The coupes in the Punachi felling series are being fully regenerated in this manner from 1936. In the Mount Stuart felling series of the Tunacadavu range only 20 acres were ponam regenerated in 1939 but about a hundred acres out of 183 acres of the regeneration area have been treated thus in 1940. Every effort should be made to regenerate the full annual area in this series in combination with field crops with the help of the local hillmen. Departmental ponam regeneration over limited areas may be undertaken for the purpose of raising *ragi* for the Government elephants when the required number of ponamdars is not available for regeneration the full extent prescribed, or for other satisfactory reasons. The ponamdars will be exempt from any assessment for the areas cultivated by them. Any balance will be planted up as an ordinary plantation in the usual manner.

347. *Allotment of ponams.*—The allotment of ponams is usually done early in April soon after the completion of lining and staking: staking facilitates allotment.

348. *Choice of species.*—Teak will continue to be the principal species to be planted in both the felling series.

Dalbergia latifolia (or *Dalbergia sissoides*) will take the place of teak in rocky areas of limited extent that exhibit themselves on clearfelling. The practice of raising this species at the same stake as the teak, or in quincunx, will be given up since it causes difficulties at the time of thinnings. Also the best rotation for it is most likely to be different from that of plantation teak so that it is advisable not to grow it in mixture with teak.

In the Punachi Felling Series, neither teak nor rosewood is at its best and the future value of the plantations is uncertain. It is therefore advisable to introduce a subsidiary species of value into it. Sandal has already naturally invaded some of the existing plantations and appears to be well suited to the locality. Though it is a well-known root parasite it is known to grow with good teak in other places without apparent injury to the latter. The monetary value of the plantations will be greatly enhanced by its introduction and the tree, being an evergreen and smaller than teak, will help to cover the soil and improve it when the teak is thinned. Sandal will therefore be introduced into the plantations of Punachi Felling Series as a subsidiary species. It will spread naturally after it is introduced.

Nursery.

349. *Seed collection and storage.*—Local seed should be used as far as possible and trees may be selected and reserved permanently for annual seed collection. Seeds should be collected only from good, straightgrown trees of clean bole: twisted grain or low branchy habit should be avoided. It is not desirable to collect seeds from very young trees—say less than 20 years old.

(*a*) Teak seed is collected off the tree when ripe, from January to March. The outer spongy cover is removed and the seeds stored in gunnies under cover. No selection or rejection need be done on account of size since small seeds do not give appreciably poorer results than average ones. The average weight of a bag of seeds is 55 lb. and about 800 seeds go to the pound. Normal germination is 60 per cent and the plant per cent is 55.

(*b*) *Dalbergia latifolia* (or *Dalbergia sissoides*) seed is collected in January-March. Only ripe seeds should be collected and it must be noted that ripe and unripe seeds occur at the same time on one tree. A bag of pods holds about 50 Madras measures and weighs 18 to 20 lb. Normal germination is 65 per cent and the plant per cent is 50.

(*c*) Ripe sandal seed should be collected from the ground. The seeds should be collected from the first seeding of the year (March-May). The sweet outer skin should be removed and the seeds stored in gunnies.

350. *Site.*—The practice of forming nurseries in regeneration areas may be continued. Since two years old stumps give at least as good results as one year olds it will be convenient and economical to utilize a nursery for two consecutive years, the larger plants being used up at the end of the first year and the smaller ones allowed to grow up for a second year. If semi-permanent nurseries are found to be more economical, there can be no objection to their formation. All nursery sites should be approved by the District Forest Officer.

351. *Beds.*—The beds should be formed after digging up the site to a minimum depth of 18 inches. The sides of the beds may be nine inches high supported by split bamboos, poles or other convenient material, so as to ensure good drainage. Each bed will be 4 feet broad and it will be separated from the next by a path 1½ to 2 feet wide. The length of the beds may be adjusted to fit the nursery site: the standard length is 40 feet. Paths should be left between the ends of the beds to a width of not less than 18 inches and at least five feet should be left between the fence and the beds all round, which should be dug over each year they are used and reformed.

352. *Size of nursery.*—One fully stocked bed of standard size (40 feet by 4 feet) should produce 1,200 to 1,500 stumps of teak. Two such beds will allow for original planting, badly stocked beds, replacements and unforeseen emergency, for each acre of 6 feet by 6 feet planting.

A standard bed of *Dalbergia latifolia* may be expected to yield 2,000–2,500 stumps.

353. *Sowing.*—The quantities of seeds to be sown per standard bed are given below :—

Teak, 25–30 lb.

Rosewood, 8–12 lb.

Dense sowing is advocated so as to ensure full stocking.

Teak seeds should be sown as early in April as possible, without any pretreatment, and covered with a thin layer of soil over which twigs and a layer of straw will be spread. The straw and the twigs will be removed as soon as germination has commenced. The beds should be kept clean weeded and the soil loosened between plants now and then as necessary. No shading will be normally required.

Dalbergia latifolia seeds will be covered with a thin layer of soil after sowing.

354. *Stumps.*—One year old teak stumps raised as described above should be of a convenient size for planting. Teak stumps under 0·3 inch and over 0·9 inch in diameter at the thicker part do not give as good results as those between these diameters. Stumps outside the range given above should not therefore be used except in an emergency.

Two year old stumps of *Dalbergia latifolia* (or *Dalbergia sissoides*) appear to grow better than one year olds. The optimum diameter for these stumps lies between 0·2 and 0·6 of an inch.

The plants in the beds should be pulled out after softening the earth by watering and loosening it with a pointed stick. The larger plants should be taken out first and the smaller ones afterwards. The beds should then be remade, consolidated and watered and all undersized stumps (i.e., those below 0·3 inch for teak) put back at an espacement of about 4 inches by 4 inches. They will yield good stumps for the following year.

A *sharp* knife must be used in making stumps. Small side roots should be trimmed off and the stem should be cut off about one inch above the collum. Six to eight inches of root should be left.

355. *Cost of stumps.*—The cost of production of stumps, including clearing of site, fencing and cost of seed, should not exceed Rs. 4 per acre of 6 feet by 6 feet planting.

356. *Planting of stumps.*—The best date for planting out teak stumps for Tunacadavu range has been found to be early May by the Provincial Silviculturist. The district generally completes planting by the end of April and finds this satisfactory. Stumps of *Dalbergia latifolia* appear to do best when planted early in May. All stumps will be planted in crowbar holes. Reasonable care should be exercised in consolidating the earth round the stump: experiment has proved that it is unnecessary to pay undue attention to this detail. Original planting should be done always on one definite side of the stake and replacements on the other. Teak stumps appear to do best when planted flush with the ground or with ½ inch of soil over them. This may very probably apply to stumps of other species when planted early, i.e., a considerable time before rains were expected.

357. *Dibbling of sandal.*—Sandal seeds will be dibbled among the teak stumps, in the regeneration areas of Punachi Felling Series, at an espacement of 30 feet by 30 feet, in quincunx with the teak. The dibbling will be done with the outbreak of the south-west monsoon in June. Five to ten seeds will be dibbled at each stake.

358. *Casualties.*—Casualties in the year of planting should be replaced as soon as possible after they occur with stumps of the respective species till the end of August. Individual casualties in the second year will not be replaced. Extensive areas of failure in teak may be replanted with teak at the discretion of the District Forest Officer. Casualties among sandal will be replaced by fresh dibbling of sandal seeds.

359. *Drainage.*—It sometimes happens that teak plants get damped off in patches during the heavy and continuous rains of July-August. The patches of soil in which this occurs are usually sufficiently well drained under ordinary conditions but are perhaps unable to drain off a continuous downpour with rapidity. Inexpensive drains will be found sufficient to remedy this temporary condition.

360. *Ponam crops and weeding.*—The field crop usually raised by ponamdars is "ragi," *Eleusine coracana*. The ponamdars prepare the soil in the customary manner after the burning of the slash in March. The cereal seed is sown in June-July as a rule. They should pull out all lantana by the root whenever it appears and dig out rhizomes of young bamboo as far as possible. The seedlings of tree species should be kept fully weeded at all times and the field crop must not be allowed to close over them at all. Regrowth of all species, except teak, should as a rule be cut back clean at ground level in all weeding operations in the first year, as they are likely to suppress the teak if left uncut. All bamboo regrowth should be cut back to *ground level* before the leaves are formed and as often as it shoots up, so as to impair permanently the vigour of the rhizomes. Natural seedlings of valuable tree species need not be cut back unless they are definitely interfering with the teak. A thorough weeding, uprooting of lantana and cutting back of bamboo regrowth should be insisted on before the ponamdars vacate the area after the harvest in October-November. Harvesting in ponam areas consists in the removal of the ears of corn only, leaving the stalks behind; this practice helps to keep down weeds for the rest of the year.

361. *Cutting back.*—Seedlings damaged by borers, wind, elephants or other causes should be promptly and neatly cut back at ground level as soon as the damage is noticed. Multiple shoots from stumps should be reduced to one *leader* as soon as the leadership is definitely established. These operations should be done under departmental supervision and should not be left to the discretion of the ponamdars. The prescriptions do not apply to sandal.

362. *Second-year tending.*—The selection of stumps of optimum diameter, early planting, and the continuous weeding during the whole of the first growing season consequent upon regeneration with field crops, together induce good height growth in teak in the year of planting. Weeding in the second year is consequently comparatively light as a rule. The Punachi teak is on a lower quality soil, however, and the growth there is distinctly slower. Two or three weedings will generally be found sufficient in the second year, in which weeds and climbers interfering with the seedlings should be cut back. All lantana will be uprooted and bamboo regrowth cut down to ground level. Damaged plants will be cut back and multiple shoots reduced to one *leader*. Large side branches competing with the leader will be pruned clean and flush with the stem. Such adventitious species as are interfering with the teak will also be cut back but not others since it is desirable to establish at this stage a good soil cover of woody growth.

363. *Third-year tending.*—During the third year, creepers will be cut, bamboo regrowth cut down to ground level, and heads of backward plants kept free. Adventitious species actually interfering with *promising* teak should also be cut back but not in order to help supressed teak.

364. *Estimated cost of formation.*—The following statement shows the approximate cost of formation of plantations when raised with agricultural crops by ponamdars. The entire cost of cutting and burning slash is shown against the department and no charge has been allowed for elephants used in piling slash for burning :—

	RS.	A.	
Clearfelling and burning	11	0	per acre.
Stump production	4	0	"
Aligning and staking	1	8	"
Planting	2	0	"
Casualty replacement	0	8	"
Weeding and tending in second year	3	8	"
Weeding and tending in third year	2	8	
Total ..	25	0	

In the case of plantations raised in the regular manner (without ponam regeneration) the cost of formation may be estimated at Rs. 37 per acre, allotting Rs. 12 for weeding in the first year.

365. *The first thinning.*—The large increase in the annual regeneration area prescribed in this plan will involve the execution of thinnings over extensive areas every year. It is therefore necessary to simplify the art of thinning, as far as may be practicable, so that the operation may be executed satisfactorily by officers or subordinates without much practical experience of thinning and by those with a comparatively low grade of technical training. The operation of thinning in well-stocked and well-grown teak plantations may be done mechanically if a plantation is taken in hand soon after the canopy has closed up but before competition among the stems has developed to such an extent as to impress considerable differences among them. It has been observed that in good quality plantations the first thinning will usually be called for at the age of 4 years (e.g., a plantation formed in 1938 will require thinning in 1942–43) and in a fully stocked area it can then be performed mechanically. The thinning should remove half the number of trees in the crop, and in practice this can best be effected by the complete removal of alternate diagonal rows in one direction. (The importance of correct alignment in staking insisted on in paragraph 344 above will now be clear : any considerable error will throw out trees from diagonals and make mechanical thinning difficult.) The poorer quality area will probably require no thinning till the eighth year when, if competition has not been keen enough to establish noticeable differences among stems, the operation of thinning can also be done mechanically. It is therefore prescribed that the District Forest Officer will decide in the fourth year of a plantation what parts of it are suitable for mechanical thinning and such thinning will then be carried out there. In areas not suitable for mechanical thinning in the fourth year he may thin selectively to such extent as he considers necessary, leaving the rest of the area until the eighth year for first thinning. Climbers should be cut at least six months before the felling of trees so that damage to standing trees may be minimized. All branches infected with *Loranthus*, on standing as well as on felled trees, should be cut and the parasite effectively destroyed, preferably by burning. Adventitious species will not be cut during thinnings unless they are interfering with the teak to be retained or are likely to interfere within two or three years. *Dalbergia latifolia* should not be cut uless it is very poorly shaped and is damaging good teak. *Largerstrœmia lanceolata* and *Grewia tiliæfolia* rapidly become ‘ wolves ’ and suppress many surrounding teak. They should not be tolerated except when other more useful tree occurs to cover the ground.

366. *Preparation of quality class maps.*—When a plantation is 6 or 7 years old the District Forest Officer will prepare a quality class map for it on the lines adopted for all existing plantations 6 years old or over and described in paragraph 282 of Chapter VI of Part I. This quality class map will help in selective thinnings as described in paragraph 368 below.

13 Vide c.c.P. 175 [illegible]

367. *The second thinning.*—The second thinning will generally be in the eighth year of the plantation. But it should be done earlier, if it is urgently required. In areas mechanically thinned at age 4, the second thinning may also be mechanical if the District Forest Officer finds them suitable for such thinning : otherwise it will be done selectively. If mechanical thinning be decided upon the crop will be reduced by 50 per cent by removing alternate planting lines and leaving the trees spaced 12 feet by 12 feet. The prescriptions regarding climber cutting, removal of *Loranthus* and adventitious species are the same as for the first thinning.

368. *Selective thinnings.*—All-India yield tables for teak show that the optimum number of stems per acre in a teak plantation at any time depends upon the height of the dominant trees in the crop. If the quality of the plantation is known, with reference to All-India quality classes, its height for any age can be read off from the tables given under that paragraph and the plantation can then be thinned approximately to the espacement shown against the height, which will consequently leave the optimum number of stems behind. The age for which the top height (and therefore the espacement) should be read is the mean age between the date of proposed thinning and the age of next thinning. In all silvicultural thinnings *supressed* teak trees will be removed. Adventitious species will not be cut unless they are interfering or about to interfere with the teak to be retained and *Dalbergia latifolia* should not be cut unless it is very poorly shaped and is damaging *good teak*. *Loranthus* should be eradicated. In marking selectively it must be borne in mind that teak crowns have a great capacity for rapid growth, especially when young, that the canopy soon closes up even after heavy opening and that *girth* rather than height is to be aimed at, so that thinnings should be heavier, as a rule, than those in vogue some years ago.

369. *Third and subsequent thinnings.*—The third thinning is likely to be required at age 13, the fourth at 22, the fifth at 34 and the last at about the age of 48, provided that thinnings have been executed to the necessary degree every time. So far as the older plantations are concerned, under-thinning has been the rule in the past, resulting in excessive congestion. An intermediate thinning between the "regulation" ages will often be required in their case so as to bring the stocking to normal without excessive opening in a single operation. All the older plantations have been examined by the writer and approximate years of thinning have been fixed for them with due regard to the rules laid down above. The final decision is however left to the District Forest Officer who will examine each plantation when a thinning is shown against it in the Tabular statement of thinnings and will come to a decision with reference to the state of the plantation, *as a whole*, at the time.

370. *Tabular statement of thinnings*—

Tunacadavu Range.

Year of thinning.	Name and year of plantation.		Area in acres.	Total area to be thinned each year.
				ACS.
1941–42	Mount Stuart	1916	6·5	
	Do.	1924	253·0	
	Do.	1930	134·0	617·2
	Do.	1931	85·5	
	Do.	1937	88·0	
	Ulandi	1937	50·2	
1942–43	Mount Stuart	1919	26·0	
	Do.	1929	103·3	
	Do.	1932	79·7	
	Ulandi	1932	50·5	
	Do.	1933	41·0	588·9
	Mount Stuart	1933	21·6	
	Do.	1934	80·5	
	Ulandi	1934	43·8	
	Do.	1938	55·5	
	Mount Stuart	1938	87·0	
1943–44	Do.	1921	24·8	
	Do.	1925	183·0	
	Do.	1926	201·0	
	Do.	1935	87·3	691·3
	Topslip Bungalow plantation	1935	5·0	
	Ulandi	1935	47·2	
	Do.	1939	56·0	
	Mount Stuart	1939	87·0	
1944–45	Do.	1922	96·1	
	Do.	1927	53·6	
	Do.	1936	87·0	479·7
	Topslip Bungalow plantation	1936	5·0	
	Ulandi	1936	55·0	
	Mount Stuart	1940	183·0	
1945–46	Do.	1923	137·96	
	Do.	1928	42·1	
	Do.	1930	134·0	
	Do.	1937	88·0	642·26
	Topslip Bungalow plantation	1937	5·0	
	Ulandi	1937	50·2	
	Mount Stuart	1941	185·0	
1946–47	Do.	1924	253·0	
	Do.	1931	85·5	
	Ulandi	1932	79·7	760·7
	Do.	1938	55·5	
	Mount Stuart	1938	87·0	
	Do.	1942	200·0	

Tunacadavu Range—cont.

Year of thinning.	Name and year of plantation.		Area in acres.	Total area to be thinned each year.
				ACS.
1947–48	Mount Stuart	1925	183·0	794·6
	Do.	1932	79·7	
	Do.	1933	21·6	
	Ulandi	1933	41·0	
	Do.	1934	43·8	
	P.S. Plantation	1934	4·0	
	Mount Stuart	1934	80·5	
	Ulandi	1939	56·0	
	Mount Stuart	1939	87·0	
	Do.	1943	198·0	
1948–49	Do.	1926	201·0	722·5
	Do.	1935	87·3	
	Ulandi	1935	47·2	
	Topslip Bungalow plantation	1935	5·0	
	Mount Stuart	1940	183·0	
	Do.	1944	199·0	
1949–50	Do.	1927	53·6	584·6
	Do.	1936	87·0	
	Ulandi	1936	55·0	
	Topslip Bungalow plantation	1936	5·0	
	Mount Stuart	1941	185·0	
	Do.	1945	199·0	
1950–51	Do.	1916	6·5	592·8
	Do.	1928	42·1	
	Do.	1937	88·0	
	Ulandi	1937	50·2	
	Topslip Bungalow plantation	1937	5·0	
	Mount Stuart	1942	200·0	
	Do.	1946	201·0	
1951–52	Do.	1929	103·3	641·8
	Do.	1938	87·0	
	Ulandi	1938	55·5	
	Mount Stuart	1943	198·0	
	Do.	1947	198·0	
1952–53	Do.	1930	134·0	675·0
	Do.	1939	87·0	
	Ulandi	1939	56·0	
	Mount Stuart	1944	199·0	
	Do.	1948	199·0	
1953–54	Do.	1919	26·0	694·5
	Do.	1931	85·5	
	Do.	1940	183·0	
	Do.	1945	199·0	
	Do.	1949	201·0	
1954–55	Do.	1932	79·7	716·2
	Ulandi	1932	50·5	
	Mount Stuart	1941	185·0	
	Do.	1946	201·0	
	Do.	1950	200·0	
1955–56	Do.	1921	24·8	486·4
	Do.	1933	21·6	
	Ulandi	1933	41·0	
	Mount Stuart	1947	198·0	
	Do.	1951	201·0	

Punachi Range.

Year of thinning.	Name and year of plantation.		Area in acres.	Total area to be thinned each year.
1941–42	Compartment 3—Punachi	1927–28	60·0	109·9
	R.A.	1936	27·0	
	Do.	1937	22·9	
1942–43	Do.	1938	21·8	21·8
1943–44	Do.	1939	27·5	27·5
1944–45	Do.	1936	27·0	51·0
	Do.	1940	24·0	
1945–46	Do.	1937	22·9	49·9
	Do.	1941	27·0	
1946–47	Do.	1938	21·8	79·8
	Do.	1942	25·0	
	Compartments 14 *b*, *c* and *d*	1922–24	33·0	
1947–48	R.A.	1939	27·5	52·5
	Do.	1943	25·0	
1948–49	Do.	1940	24·0	49·0
	Do.	1944	25·0	
1949–50	Compartment 3	1927–28	60·0	139·0
	R.A.	1936	27·0	
	Do.	1941	27·0	
	Do.	1945	25·0	
1950–51	Do.	1937	22·9	73·9
	Do.	1942	25·0	
	Do.	1946	26·0	

Punachi Range—cont.

Year of thinning.	Name and year of plantation.		Area in acres.	Total area to be thinned each year.
				ACS.
1951–52 ..	R.A. ..	1938	21·8	71·8
	Do. ..	1943	25·0	
	Do. ..	1947	25·0	
1952–53 ..	Do. ..	1939	27·5	77·5
	Do. ..	1944	25·0	
	Do. ..	1948	25·0	
1953–54 ..	Do. ..	1940	24·0	75·0
	Do. ..	1945	25·0	
	Do. ..	1949	26·0	
1954–55 ..	Do. ..	1941	27·0	81·0
	Do. ..	1946	26·0	
	Do. ..	1950	28·0	
1955–56 ..	Do. ..	1942	25·0	75·0
	Do. ..	1947	25·0	
	Do. ..	1951	25·0	

SECTION 7.—MISCELLANEOUS REGULATIONS.

371. *Demarcation.*—The plantations will be indicated by small wooden boards of teak with the year of formation engraved on it (not painted).

372. *Clearing inspection paths.*—All roads and inspection paths inside plantations will be cleared each year. They should be marked on the 12-inch map.

373. *Fire protection of plantations.*—All plantations will be protected against fire by an exterior line 20 feet wide, which will be cut and burnt every year, and by the annual clearing of internal boundary between plantations to a width of 12 feet.

Fire patrols employed on general protection will patrol plantations also as part of their duties.

The total length of external boundaries of plantations in Tunacadavu range is 34 miles at present, and the internal boundaries are 11·5 miles. In another 7 years, these lengths will increase to 44 miles and 18 miles, respectively, so that the latter will be taken as averages for the calculation of annual expenditure on fire protection in the financial forecast. In the Punachi range, the external boundaries are only 5 furlongs at present and internal boundaries extend over a length of 3 furlongs only. An average of one mile for the former and one and half miles for the latter will be taken for calculating expenditure in the financial forecast.

374. *Annual cost of fire protection of plantations.*—The external boundaries are estimated to cost Rs. 20 per mile and the internal ones Rs. 12 per mile. The average annual cost of fire protecting teak plantations is estimated at Rs. 1,134 at the rates mentioned above.

SECTION 8.—CONTROL.

375. *Control forms.*—A complete duplicate set of control forms, with the respective prescriptions written up for a period of 15 years, will be supplied to the District Forest Officer. Each major operation in the working circle and each important cultural operation has a separate form. The record of works deals only with minor prescriptions such as fire protection and road repairs.

The following forms will be supplied :—

(1) Control of final fellings.

(2) Record of yield from final fellings.

(3) Control of regeneration operations.

(4) Control of thinnings.

(5) Record of yield from thinnings.

(6) Record of works.

376. *Other records.*—A *nursery ledger* and a *registration ledger* will be maintained in the forms in use at present. The *plantation history* maintained at present will continue to be written up as fresh plantations are being formed, a separate set being kept for each felling series. A map showing quality classes on the All-India basis should be prepared in

the sixth or seventh year of a plantation to a scale of 12 inches to 1 mile, and attached to the history. Maps have been prepared by the working plan staff for plantations down to five years of age in 1940 : copies of these should be attached to the plantation history against the respective plantations.

CHAPTER III.—WORKING PLAN FOR THE DECIDUOUS SELECTION WORKING CIRCLE.

SECTION 1.—GENERAL CONSTITUTION OF THE WORKING CIRCLE AND CHARACTER OF THE VEGETATION.

377. *General constitution.*—The Deciduous Selection Working Circle includes the deciduous timber forests of the Tunacadavu range not covered by the Conversion Working Circle and excludes stunted, open, grassy jungle supporting no exploitable timber and steep, rocky and inaccessible areas allotted to the Protection Working Circle. Parts of Mr. Laurie s Selection Working Circle have been considered suitable for clearfelling and planting with teak and have therefore been transferred to the Conversion Working Circle, leaving the balance in the Deciduous Selection Working Circle. Some localities included in Mr. Laurie's Clearfelling Working Circle have been found to be insufficiently drained and are therefore liable to become swampy on clearfelling. They are not of large extent but, in the light of experience gained in the past in the matter of areas suitable for clearfelling and planting with teak, they have been relegated to the Selection Working Circle. Also, areas of small extent inside a clearfelling coupe judged unsuitable for clearfelling and planting with teak, have been included in this working circle and will not be subjected to clearfelling.

The deciduous timber forests of the Villoni valley, in Pollachi range, contain an appreciable quantity of exploitable valuable timber. This area has therefore been included in this working circle.

378. *Area.*—The total area of the working circle is 12,768 acres, of which 12,268 acres lie in Tunacadavu range and 500 acres in Pollachi range.

379. *Character of the vegetation.*—The general types of vegetation have been described in Chapter II of Part I. The Deciduous Selection Working Circle consists chiefly of subtypes 2 to 5, which is characterized by moderate height growth, a great variety of species and a low proportion of bamboos. All accessible rocky and swampy areas are included in this working circle. The growth in the Villoni valley is of a lower quality than that in Tunacadavu range, but the type of vegetation is similar.

SECTION 2.—DIVISION OF THE AREA.

380. *Blocks.*—The Deciduous Selection Working Circle lies in the Mount Stuart, Tekkadi, Ulandi and Palakadavu blocks of Tunacadavu range and in the Villoni block of the Pollachi range.

381. *Compartments.*—Parts of the permanent compartments of the Tunacadavu and Punachi ranges fall in this working circle. Such parts will form sub-compartments designated a, b, c, within the main compartment. The allotment is given in the statement under paragraph 313 of Chapter II of Part II.

382. *Felling Series.*—Two felling series were formed by Mr. Laurie in his Selection Felling Working Circle for the Tunacadavu range—the Mount Stuart felling series in Mount Stuart and Tekkadi blocks and the Ulandi felling series in the Ulandi and Palakadavu blocks. The composition of these two series has now been altered by the transfer of suitable areas from them to the Conversion Working Circle and the addition of other areas to them. The division into two felling series will, however, be maintained since the conditions governing exploitation are different in each case. But the Mount Stuart felling series will be re-named " The Tunacadavu felling series " so that it might not be confused with the felling series of the same name in the Conversion Working Circle. The Ulandi felling series will continue to be named as such.

The Villoni valley forms a separate block and has to be exploited in a different manner; it will therefore form a separate series—the Villoni felling series.

The areas of the three felling series are given below :—

(1) The Tunacadavu felling series, 6,335 acres.

(2) The Ulandi felling series, 5,933 acres.

(3) The Villoni felling series, 500 acres.

SECTION 3.—ANALYSIS AND VALUATION OF THE CROP.

383. *Tunacadavu Felling Series.*—A complete enumeration of the crop over the Mount Stuart and Tekkadi blocks was carried out by Mr. Laurie in 1928–30. The enumeration showed that there was a great deficiency in the number of trees in the lower girth classes and that the forests were greatly understocked, as a whole. The intensive fires of 1934–35, following the general flowering and death of bamboos over the whole area, have accentuated this understocking by the destruction of a considerable number of trees but it has also stimulated the natural regeneration of teak to an appreciable extent. Much of this natural regeneration is being swamped by the resulting young bamboo regeneration but a considerable proportion may be expected to push through it and survive and grow into well-shaped trees. The valuation made by Mr. Laurie will be used in this working plan for assessing the yield from annual felling areas.

384. *Ulandi Felling Series.*—Mr. Laurie carried out a cent per cent enumeration over the Ulandi block and a strip enumeration over the Palakadavu block covering 17·2 per cent of the area. The whole of the Ulandi felling series has been exploited for mature and overmature timber between 1931 and 1940 and it is not proposed to exploit the area during the period of the present working plan.

385. *Villoni Felling Series.*—An enumeration of all saleable species above a breast height girth of 5 feet was made in 1930 by the Range Officer, Pollachi range, under the direction of the District Forest Officer. This enumeration list was traced out and the volumes of all teak and rosewood trees above a breast height girth of 6 feet over bark were calculated with reference to the local volume table for Punachi. The results showed 334 trees of teak of 19,000 cubic feet (including dead trees) and 110 trees of rosewood of 5,500 cubic feet. In addition there are 34 trees of *Pterocarpus marsupium* the volume of which may be put down at 1,500 cubic feet. The total volume of exploitable timber over 6 feet girth at breast height in the Villoni valley is thus likely to be about 26,000 cubic feet. This does not include about 150 trees of teak, rosewood and *Pterocarpus marsupium* which were reported too unsound to be worth exploitation or sound enough to produce only spokes and felloes.

SECTION 4.—METHOD OF TREATMENT.

386. *Silvicultural system.*—The artificial regeneration of gaps created by selection fellings in the past was given up owing to its high cost, the dispersal of energy inherent in it, and the damage caused to regeneration by game. Until cheap methods of ensuring natural or artificial regeneration of valuable species have been evolved, the exploitation of areas not suitable for clearfelling and artificial regeneration will have to be confined to the harvesting therefrom of dead, dying and overmature trees yielding marketable timber.

387. *Ulandi Felling Series.*—The whole of the Ulandi felling series was exploited for all dead, dying and overmature saleable trees between 1931 and 1940, under the prescriptions of Mr. Laurie's Working Plan. There will therefore be no exploitation in this series until the close of the first felling cycle which was fixed by Mr. Laurie at 40 years, or until easier transport facilities are brought into existence. There is little chance of the realization of such a contingency during the period of this plan.

388. *Exploitable size for Tunacadavu series.*—Beyond a girth of 6½ feet at breast height a tendency for trees at Mount Stuart to become unsound was noticed by Mr. Laurie. This fact, and the existence of a considerable quantity of overmature timber revealed by a complete enumeration, resulted, among other factors, in the adoption of a minimum girth limit of 7½ feet at breast height for exploitation in the first felling cycle. Since only ten years have elapsed out of the forty years allotted to the felling cycle, and since no valid reasons can be put forth against this girth limit, it will continue to be in force. The exploitation of only overmature trees from a forest area is in accordance with basic principles of forestry.

An analysis of past fellings in selection coupes, under the same girth limit, shows that the number of trees of all species actually felled varied from 0·8 per acre to 1·5 per acre for six consecutive years and was 2·3 per acre only in the first coupe felled. The actual number of trees that will be exploited in future is therefore likely to be about one per acre, on an average, which is a very safe intensity of felling in a selection forest.

Number of trees per acre actually felled in Selection coupes from 1931 to 1939.

Coupe number.	I.	II.	III.	IV.	V.	VI.	VII.
Trees felled per acre ..	2·3	1·3	1·[illegible]	1·4	0·8	1·0	1·0

389. *Exploitable size for Villoni series.*—The quality of the Villoni forests is distinctly low and teak shows a tendency to unsoundness after a breast height girth of 6 feet. The exploitable size will therefore be six feet for all saleable species in this series.

390. *Rotation.*—Mr. Laurie fixed 160 years as the rotation for the Selection Working Circle. No fresh information has come to light indicating the necessity for reconsideration: the period of rotation will therefore continue to be 160 years.

391. *Felling cycle.*—For the Tunacadavu series, the felling cycle of forty years prescribed by Mr. Laurie will be retained. In view of the large increase in the annual clearfelling area prescribed in this plan, a long felling cycle will reduce the yield from selection fellings and will thus help to prevent gluts in the timber market. The same felling cycle will be adopted for the Villoni series.

392. *Regulation of fellings.*—Mr. Laurie calculated the annual yield from his Selection Working Circle by Von Mantel's original formula on the basis of his enumerations. The constitution of his Selection Working Circle has now been considerably altered by the transfer of areas to the Conversion Working Circle and *vice versa* and consequently Mr. Laurie's figure of annual yield will not be applicable to the new Selection Working Circle. The actual yields obtained from selection fellings in the past do not compare favourably, with the estimated yields, and Mr. Laurie's volume tables have had to be revised to suit local conversion practice. The calculation of yield from the newly constituted working circle on the basis of Mr. Laurie's enumeration figures is not likely to give useful results, in view of past actuals and of the death and disappearance of a considerable number of trees in the fires of 1934–35 and the time and trouble which the work will involve. The fellings will therefore be regulated by area, approximately equal areas being felled every year.

The Villoni series will be exploited in two successive years, about one half of the total number of overmature trees enumerated being removed in one year and the balance in the next.

393. *The annual coupe.*—The size of the average coupe is obtained by dividing the area of the felling series by the felling cycle. As a result of the redistribution of working circles effected now, areas within the Deciduous Selection Working Circle which have been exploited already under selection fellings will be excluded from fellings in the current felling cycle. The balance available for fellings will be divided by the balance of 30 years in the felling cycle, to give the area of the future average annual coupe. A redistribution of coupes will be necessary at the end of the first felling cycle so as to equalize all coupes.

In the case of the Villoni series, the whole area will be exploited in two years. One hundred and sixteen teak trees over 6 feet in girth will be marked consecutively, commencing from one side of the valley and all *Dalbergia latifolia* and *Pterocarpus marsupium* over 6 feet in girth will also be marked over the area covered by the 160 teak trees; this area will then be exploited in one year, and the balance in the next.

The total area of the Tunacadavu felling series is 6,335 acres of which 955 acres have been exploited during the last ten years. The balance of 5,380 acres divided by 30 (the balance of the felling cycle) gives an average annual coupe of 179 acres.

394. *Selection areas included in Conversion Working Circle.*—Small areas unsuitable for clearfelling and planting are included in the Conversion Working Circle. They will be exploited simultaneously with the clearfelling or subsidiary coupe within which they occur but under the prescriptions of this chapter. The extent of such inclusion in any year will count against the selection coupe of that year.

395. *Estimate of yield.*—An estimate of probable yield from each coupe has been made on the basis of Mr Laurie's enumeration figures. The enumeration data were analysed and the number of trees above $7\frac{1}{2}$ feet girth within the coupe was ascertained for each species and classified in girth classes. The estimated volumes were then calculated with reference to the new volume outturn tables, mentioned in paragraph 281. In the case of *Terminalia tomentosa*, *Terminalia paniculata*, *Lagerstrœmia lanceolata* and other miscellaneous species, past actuals from Selections Coupes II to VII felled after the 1935 fires, were compared with the working plan estimates, and found to be only from 20 to 40 per cent of the latter. The outturn as calculated according to the new volume tables and given in the subjoined statement may therefore have to be reduced to 33 per cent in their case so as to give figures which are likely to be reasonably close to actuals.

For teak and rosewood, the actuals were, on average, comparable with the estimates and the figures as given in the statement are likely to be sufficiently close to actuals, without any reduction.

396. *Yield from areas not enumerated.*—Some areas in Mr. Laurie's Protection Working Circle have now been absorbed in the Deciduous Selection Working Circle. No enumerations were made by Mr. Laurie in such areas and consequently no estimate of yield could be given for them. Their extent has been noted in each coupe, wherever they occur.

SECTION 5.—EXPLOITATION.

397. *Demarcation and survey.*—The coupes marked on the map will be demarcated clearly on the ground.

398. *Marking in Tunacadavu Felling Series.*—(1) All dead, dying and fallen trees of saleable species will be marked for felling.

(2) All saleable trees of and above 7½ feet girth at breast height over bark, will be marked for felling, but hollow and *Ficus* infested trees of valuable species like teak, rosewood and *Pterocarpus marsupium* which are not likely to yield reasonably sound logs should be spared so as to serve as seed bearers.

(3) The numbering of marked trees, preparation of the enumeration register and its abstract, climber cutting, and checking of marking by the District Forest Officer, will be done in accordance with the prescriptions laid down for such operations in subsidiary coupes in Chapter II of Part II.

399. *Marking in Villoni Felling Series.*—Except that only teak, *Dalbergia latifolia* and *Pterocarpus marsupium* will be marked for exploitation among living trees, the rules will be the same as for Tunacadavu series above.

400. *Extraction scheme.*—An extraction scheme should be drawn up for the coupe at the time of marking showing the location of convenient dragpaths, depots and cart-tracks on a map drawn to the scale of 12 inches to 1 mile. The extraction plan should be approved by the District Forest Officer. No such scheme will be required if the coupe is to be worked by a contractor.

401. *Felling, logging, squaring, etc.*—Felling, logging, dressing, dragging, numbering and other works connected with departmental extraction of timber will be carried out in the manner prescribed in Chapter II of Part II of this plan.

402. *Exploitation of Villoni series.*—The Villoni series may be worked through the agency of contractors. A contract covering the whole area of the series to be exploited in two successive years will perhaps be found more attractive by intending purchasers than a one-year lease.

The exploitation of the area with the help of elephants does not appear to be difficult. The logs are best dragged down to the place where an old channel took off from the Villoni odai and then down an adjoining stream to the top of Coupes IX and X of the Kottur fuel series. They can then be carted to Pollachi.

If it be decided to build an extraction road, an estimate for Rs. 2,000 has been prepared for a length of about 6 furlongs and is filed with the enumerations record. But dragging by elephants will still have to be done for part of the distance even if this road be constructed.

SECTION 6.—STATEMENTS OF FELLINGS AND YIELD.

403. *Tabular statements of fellings and yield.*—Tabular statements of fellings and yield are given below showing the areas of the coupes, their distribution, proposed year of exploitation and estimated outturn (without making any deductions based on past actuals).

Selection coupes—Tunacadavu Range.

Year of felling. (1)	Coupe number. (2)	Selection area in clear-felling coupe. (*a*) (3)	Selection area in subsidiary coupe. (*b*) (4)	Separate selection area. (*c, d, e, f*) (5)	Total area of selection coupe a+b+c, etc. (6)
		ACS.	ACS.	ACS.	ACS.
1941–42	I a, b, c	28	49	100	177
1942–43	II a, b, c, d	20	7	162	189
1943–44	III a, b, c	25	7	138	170
1944–45	IV a, c, d	24	..	172	196
1945–46	V a, c, d, e	28	..	158	186
1946–47	VI b, c, d	..	9	169	178
1947–48	VII a, c, d, e	16	..	148	164
1948–49	VIII a, b, c, d, e, f	13	22	152	187
1949–50	IX a, c, d	4	..	182	186
1950–51	X a, c, d, e	12	..	176	188
1951–52	XI a, b, c	68	5	105	178
1952–53	XII a, c, d, e	48	..	125	173
1953–54	XIII a, b, c	78	45	58	181
1954–55	XIV c	..	..	180	180
1955–56	XV c, d, e, f	..	..	182	182

Note.—The suffix a indicates the area of the selection coupe included in the clear-felling coupe; b indicates area included in the subsidiary coupe; c, d, etc., indicate separate bits of selection coupe not included in clearfelling or subsidiary coupes.

Statement of estimated yield of timber from selection felling coupes—Tunacadavu Range.

Year of felling.	Coupe number.	Estimated yield in cubic feet. Teak.	*Dalbergia latifolia.*	*Terminalia paniculata.*	*Terminalia tomentosa.*	*Lagerstroemea lanceolata.*	*Grewia tiliaefolia.*	Total volume
1941–42	I	2,929	630	3,652	1,544	258	128	9,141
1942–43	II	1,064	498	1,158	810	258	..	3,788
1943–44	III	3,082	66	664	434	237	64	4,547
1944–45	IV	7,256	962	5,112	4,546	4,218	704	22,798
1945–46	V	15,910	830	5,668	5,132	732	64	28,336
1946–47	VI	9,830	166	3,590	6,868	179	64	20,697
1947–48	VII	14,871	498	2,656	5,038	616	320	23,999
1948–49	VIII	6,307	730	1,892	4,146	158	144	13,377
1949–50	IX	1,296	298	762	1,158	79	..	3,593
1950–51	X	1,467	864	3,448	2,940	811	256	9,786
1951–52	XI	6,465	828	6,636	7,214	932	672	22,747
1952–53	XII	11,792	498	3,948	3,784	258	192	20,472
1953–54	XIII	2,049	396	726	1,364	237	..	4,772
1954–55	XIV	518	396	396	248	416	64	2,038
1955–56	XV	3,312	660	4,318	1,008	1,411	64	10,773

Remarks.—The areas noted below have not been enumerated by Mr. Laurie and so the yields have been furnished only for the balance areas of these coupes :—

I	102	V	48
II	156	VI	22
III	137	XIV	171
IV	39	XV	115

SECTION 7.—CONTROL.

404. *Control records.*—A duplicate set of control forms will be issued to the District Forest Officer. The special forms for this working circle will be a control of fellings and a record of yield from fellings.

CHAPTER IV.—WORKING PLAN FOR THE EVERGREEN SELECTION WORKING CIRCLE.

SECTION 1.—GENERAL CONSTITUTION OF THE WORKING CIRCLE AND CHARACTER OF THE VEGETATION.

405. *General constitution.*—The Evergreen Selection working circle is composed of Mr. Laurie's Karianshola working circle, and Mr. Sarma's Selection working circle. The Karianshola working circle consists of a compact block of evergreen forest lying to the north-west of Topslip, with one or two small outlying portions. Mr. Sarma's Selection working circle was formed out of the best and most easily accessible portions of the Kalar Valley evergreens near the cinchona plantations in that valley.

406. *Character of the vegetation.*—The vegetation is tropical evergreen forest (or shola), described in detail in Chapter II of Part I. The Karianshola belongs to the *Hopea-Mesua association* in which *Hopea parviflora* and *Mesua ferrea* occur in appreciable quantities. In the Kalar Valley, two sub-types may be distinguished the *Palaquium-Mesua association* and the *Pœciloneuron-Cullenia association*, the latter being an edaphic formation occurring in soils with a high moisture content for the greater part of the year.

SECTION 2.—DIVISION OF THE AREA.

407. *Area.*—The area of the working circle is 6,945 acres.

408. *Felling series.*—The working circle divides itself naturally into two felling series—the Karianshola felling series in Tunacadavu range, with an area of 2,060 acres and the Kalar felling series, in Punachi range, extending over 4,885 acres at present. The Kalar felling series may be extended to cover about twice the present area if the sale price of railway sleepers improve appreciably and if extraction roads be constructed.

409. *Compartments.*—Compartments, with natural features as boundaries, have been formed in Mount Stuart forests, of which Karianshola forms a part.

SECTION 3.—ANALYSIS AND VALUATION OF THE CROP.

410. *Karianshola Felling Series.*—In 1926, a 50 per cent enumeration with typographical survey was carried out by the Logging Engineering branch over the whole of the Karianshola. The enumeration was checked by Mr. Laurie in 1928–30 and found to be so inaccurate as to be quite valueless. The topographical map however was found sufficiently accurate to be incorporated in his 12-inch map. Form factors were prepared

by Mr. Laurie for arriving at log volumes from breast height girths and lengths of boles: these represent the ratio of midgirth over bark to breast height girth over bark and are given below :—

	ACS.
1. *Hopea parviflora*	0·84
2. *Calophyllum tomentosum*	0·86
3. *Mesua ferrea*	0·87
4. *Elæodendron glaucum*	0·88
5. *Dysoxylum malabaricum*	0·89
6. *Canarium strictum*	0·91
7. *Bischofia javanica*	0·91
8. *Vitex altissima*	0·91

411. *Kalar Felling Series.*—Mr. Sarma enumerated the more important timber species over the felling series. A few convenient base lines were selected and strip lines were cut at right angles to them at 2 and 4 chain intervals. The base and strip lines were measured and the trees on the 2 chain strips were enumerated, thus obtaining the stand over one-third of the area distributed over the felling series—obviously unsound trees were not counted. The results of the enumerations were arranged in ten coupes. Six of these coupes will have been worked by the end of 1940–41. The results for the last four coupes are given below :—

Tabular statement of trees enumerated in Kalar Felling Series.

Coupe number.	Area in acres.	Species.	Number of trees actually enumerated.										Total number of trees over 7′ girth.	
			3′—4′	4′—5′	5′—6′	6′—7′	7′—8′	8′—9′	9′—10′	10′—11′	11′—12′	Above 12′	Actually enumerated (one-third).	Expected in the whole coupe.
(1)	(2)	(3)	(4)										(5)	(6)
VII ..	479·0	*Mesua ferrea*	535	494	360	304	229	129	57	33	11	..	459	1,323
		Pœciloneuron indicum	309	226	164	163	179	147	83	77	46	7	539	1,509
		Dichopsis elliptica	184	204	150	80	50	18	8	3	2	..	81	228
		Cedrela toona	7	2	2	3	3	..	..	2	3	..	8	24
		Dysoxylum malabaricum	7	3	4	1	1	1	..	..	..	..	2	6
		Calophyllum	7	6	3	3	3	8	2	..	..	..	13	40
		Artocarpus integrifolia	21	39	22	27	10	14	6	5	..	1	36	110
		Heritiera papilio	8	6	6	5	10	8	2	3	1	..	24	73
VIII ..	559·6	*Mesua ferrea*	442	402	295	236	251	139	53	34	13	2	492	1,421
		Pœciloneuron indicum	369	366	224	228	263	206	95	128	86	4	782	2,346
		Dichopsis elliptica	111	99	59	8	21	8	1	..	..	..	30	92
		Cedrela toona	5	2	2	2	4	3	4	3	1	..	15	38
		Dysoxylum malabaricum	..	..	..	..	..	..	..	..	..	..	..	..
		Calophyllum	3	12	9	6	8	6	..	1	1	..	16	40
		Artocarpus integrifolia	60	62	45	37	25	11	1	1	..	..	38	96
		Heritiera papilio	8	5	4	8	5	6	3	2	..	..	16	40
IX ..	599·1	*Mesua ferrea*	396	350	311	277	214	111	59	43	23	1	451	1,366
		Pœciloneuron indicum	288	246	224	189	191	132	70	96	44	..	533	1,611
		Dichopsis elliptica	428	365	286	103	69	17	7	2	1	..	96	277
		Cedrela toona	1	..	..	1	1	1	..	1	1	..	3	9
		Dysoxylum malabaricum	..	..	..	..	..	..	..	..	..	..	..	..
		Calophyllum	14	3	7	12	6	5	3	6	4	..	24	73
		Artocarpus integrifolia	15	30	18	13	5	5	1	..	..	..	11	33
		Heritiera papilio	2	+ 1	2	1	..	..	2	1	2	..	5	15
X ..	602·1	*Mesua ferrea*	444	406	369	296	249	136	7 0	48	28	1	532	1,536
		Pœciloneuron indicum	386	272	245	239	213	206	123	95	75	3	715	2,127
		Dichopsis elliptica	432	341	202	121	68	25	4	..	..	..	97	281
		Cedrela toona	1	2	3	1	1	2	3	..	1	..	7	21
		Dysoxylum malabaricum	..	..	..	..	..	..	..	..	..	..	..	..
		Calophyllum	1	10	8	12	3	3	3	3	1	..	13	40
		Artocarpus integrifolia	13	23	20	13	9	2	..	..	..	..	11	33
		Heritiera papilio	4	..	3	3	1	..	..	..	..	..	1	3

SECTION 4.—METHOD OF TREATMENT—KARIANSHOLA FELLING SERIES.

412. *General.*—The "*sine qua non*" of any exploitation of the Karianshola is that it should be kept primarily as a protective forest so that its evergreen character may be maintained. The exploitation proposed must be regarded as experimental, to a great extent; it is not yet known what evergreen timbers may be saleable and attempts to sell marked trees standing in 1939 and 1940 did not meet with success. The regeneration proposed is also experimental though considerable success has been achieved by the Provincial Silviculturist in his experimental garden in Karianshola.

413. *Silvicultural system.*—The silvicultural system will be very light selection fellings of saleable species. Artificial regeneration under the top canopy will be experimented with over 5—10 acres every year, in combination with cardamoms.

414. *Exploitable size.*—The following breast height girth limits down to which trees may be felled were fixed by Mr. Laurie with reference to the size at which trees tend to become unsound; these limits will be adopted :—

Mesua ferrea—6 feet.
Hopea parviflora—7 feet.
Calopyllum tomentosum—8 feet.
Other saleable species—8 feet.

415. *Rotation.*—Mr. Laurie fixed a rotation of 150 years, arbitrarily. The determination of the correct rotation is not of great importance now for the method of working prescribed; the rotation fixed by Mr. Laurie will continue to be in force.

416. *Felling cycle.*—The felling cycle of 25 years fixed by Mr. Laurie will continue to be in force. This cycle gives an annual coupe of about 82 acres, which is a convenient size for management.

417. *Estimate of annual yield.*—On an estimate of 125 cubic feet of timber per tree of 7½ feet girth at breast height, and an yield of about 3 trees per acre of the coupe, the outturn of timber per coupe may be expected to be about 30,000 cubic feet.

418. *Demarcation of coupes.*—The coupe will be laid out on the ground from the map and clearly demarcated.

419. *Marking for felling.*—(*a*) Timber of saleable species of not less than the following girth limits will be marked :—

Mesua ferrea	6 feet girth over bark at breast height.
Hopea parviflora	7 do.
Calophyllum tomentosum	9 do.
Other saleable species	8 do.

(*b*) The total number of trees to be marked in a coupe shall not exceed three per acre of the coupe.

(*c*) Two trees within twenty yards of each other shall not be marked.

(*d*) As far as possible the largest trees and trees showing signs of overmaturity and unsoundness should be marked first.

(*e*) As many trees as possible, up to the specified number of three per acre, will be marked provided it is possible to do so without breaking rule (*c*) above. If it is not possible to make up the quota by marking trees known to be saleable, the total number may be made up by trees of other species for which a market may be developed.

(*f*) No trees labelled as botanical specimens or seed trees will be marked.

420. *Extraction scheme, felling, logging, etc.*—Rules regarding date of marking, estimate of volumes, preparation of an extraction scheme, felling, logging, dragging, etc., are the same as those prescribed for the Conversion working circle. If the marked trees cannot be sold standing, departmental fellings may be resorted to provided there is an *assured* market for the outturn. All extraction should be completed by the end of March.

SECTION 5.—METHOD OF TREATMENT—KALAR FELLING SERIES.

421. *General.*—The Kalar Felling Series falls within those areas originally earmarked by Government for the formation of cinchona plantations. When Mr. Sarma drew up his working plan it was not expected that the locality covered by the series would be taken up for planting in the near future. But in G.O. No. 87, Press, dated 9th January 1940, Government sanctioned an extension of cinchona planting in the Kalar valley over an area of 1,100 acres during the years 1941–42 to 1945–46. About a 1,000 acres of this proposed plantation will encroach into the Kalar Felling Series constituted by Mr. Sarma.

The general policy of Government regarding further extension of cinchona planting in this valley will be based on the results of the planting now ordered. But it is highly probable that every effort will be made in expanding cinchona planting as rapidly as possible to an extent that will make India independent of foreign countries in the matter of the supply of quinine required by her.

422. *Object of management.*—The object of management will depend entirely on the decision that may be taken with regard to further expansion of cinchona planting in this locality. In areas that will assuredly be taken up for such planting in the near future the object will be to exploit from them whatever timber can be profitably marketed; they will then be handed over to the Cinchona department for clearfelling and planting. Areas which are not likely to come under such planting in the near future will be exploited for mature and overmature saleable timber without endangering their evergreen character.

423. *Silvicultural system.*—For areas that are not likely to come under cinchona in the near future the exploitation will be on a selection system under which mature and overmature trees of saleable species will be felled, limited to a safe maximum per acre which is not likely to cause openings in the canopy liable to endanger the character of the forest.

424. *Species to be exploited.*—*Mesua ferrea* is the only species which can be profitably exploited from these forests at present. A small demand for *Cedrela toona* exists for cigar boxes.

425. *Exploitable size.*—A minimum exploitable girth of 7 feet over bark at breast height was fixed by Mr. Sarma for all species; this minimum will be continued.

426. *Rotation*.—The fixing of a period of rotation is not essential at present since only mature and overmature trees will be exploited in this felling cycle.

427. *Felling cycle*.—A felling cycle of ten years was fixed by Mr. Sarma and six years of it will elapse at the end of 1940–41. Four coupes will be available for working for the rest of the felling cycle. A second felling cycle is not contemplated during the currency of this working plan since a considerable part of the felling series (about 1,000 acres) will have been clearfelled and planted with cinchona in the next five years and it is probable that the rest of it may also come under planting shortly afterwards.

428. *Coupes*.—Coupes VII to X as marked on the maps by Mr. Sarma will be worked during the balance of the felling cycle.

429. *Yield*.—The yield will be regulated by area. The coupes have been formed so as to yield equal numbers of trees of *Mesua ferrea* over 7 feet in girth at breast height over bark.

430. *Roads*.—A new road system will be necessary for working Coupes VIII to X of the felling series. The construction of a road in continuation of certain private roads belonging to neighbouring tea estates has been proposed. This road will enter the reserve on the northern boundary of Coupe X and continue at a ruling gradient of 1 in 15, down to the south-eastern corner of Coupe IX near Kalar. The cost of constructing this road and maintaining it and the charges which the department will have to meet on account of using the private roads mentioned above are likely to amount to Rs. 16,850 for the three years the road system is likely to be used. Even after charging the full cost of the road system to the sleepers, which are likely to be obtained from Coupes VIII to X, the production costs of one broad gauge sleeper ex-Pollachi depot is not expected to exceed Rs. 4–6–0 on the average, which compares very favourably with the sale price of a broad gauge sleeper, which is now Rs. 7.

The road proposed will also be useful if it is decided at any time to extend exploitation to the more remote areas of the Kalar valley not at present included in the Kalar Felling Series.

SECTION 6.—EXPLOITATION—KALAR FELLING SERIES.

431. *Marking rules*.—During the months of January and February, the trees for felling should be marked by an officer not lower in rank than a Ranger and estimates prepared for extraction. A Gazetted Officer must check as much of the marking as possible every year; and it is suggested that 10 per cent of the marking may be looked upon as a minimum for this purpose. The following rules should be observed :—

(*a*) Only species for which there is a specific demand should be marked.

(*b*) Trees with a girth of 7 feet or more at $4\frac{1}{2}$ feet from the ground (on the uphill side over sloping ground) may alone be marked.

(*c*) If the demand is for *Mesua ferrea* only, all trees with a girth of 7 feet or more *may be marked* though it is not prescribed that they *must* all be marked. (Enumerations show that the average number of such trees in the best coupe is only 4 per acre, so that any excessive opening of the canopy need not be feared by their complete removal.)

(*d*) If species other than *Mesua ferrea* are in demand, the following restriction should be imposed.

(*e*) The trees marked for felling should be at least 60 feet apart from each other.

(*f*) The marking should proceed systematically, in serial order from one end of the coupe to the other.

(*g*) The trees marked for felling should have numbers engraved on them in two positions so that, after felling, the stump as well as the tree may be identified.

(*h*) All climbers on trees marked as well as on neighbouring trees should be cut at the time of marking, effectively, so that when felling takes place, the damage to neighbouring trees may be minimized.

(*i*) The marking officer should estimate the height of bole of the trees marked and form an estimate of the timber contents and, in the case of *Mesua*, of the number of broad gauge sleepers that may be obtained from the tree and enter it in the appropriate column of the marking register to serve as a basis for the preparation of estimates for felling and conversion.

(*j*) Trees which are unsound *need not* be marked for felling as they will produce seed; they will naturally die in course of time without making an appreciable opening in the canopy.

432. *Felling and conversion.*—The advantage of exploitation through the agency of contractors who have successfully worked in this locality should be borne in mind. The felling of marked trees should be done with care and as far as possible in a direction in which the falling crown will cause the least damage. *Mesua* timber being subject to felling shatter, great care and close supervision are necessary in the felling operations. Trees should be felled as low as possible, and when feasible, uphill.

Directly the tree falls, it is essential that such of the natural regeneration and young growth as can be saved be freed from the fallen crown. A little immediate care will go a long way to effect this. All damaged seedlings should be cut back close to the ground.

Logging should proceed simultaneously with felling and the trees felled should not be left unlogged for more than 24 hours. This rule will stimulate the operation of freeing existing natural regeneration from the fallen crown. Logging of *Mesua* should be primarily for the production of broad-gauge sleepers. In this respect no hard and fast rule can be laid down as each tree is to be dealt with in a different manner. Meter-gauge sleepers are to be looked upon as the outturn of the inevitable waste in the conversion of broad-gauge sleepers. In erecting saw platforms, the sawyers should be prohibited from felling the poles of the more important species of trees such as *Mesua ferrea, Pœciloneuron indicum, Cedrela toona* and *Dichopsis elliptica*, unless they have been broken or damaged beyond recovery by the fall of other trees. They should be made to fell and make use of damaged trees not fit for conversion, or trees of inferior species.

The sawyers usually employed are skilled in the work and know exactly what sizes are to be sawn; nevertheless, there must be strict supervision to ensure that undersized sleepers are not produced. Mistakes in conversion result in the production of meter-gauge sleepers which are uneconomical and should be guarded against.

Sawing at stumpsite and manual haulage of the sleepers to central depots, which is the custom in the locality, is suited to the nature of the country and should be continued.

433. *Specification of sleepers.*—The specification for sleepers acceptable to the railways is given in the Madras Forest Pocket Book, and these specifications, with such modifications as may be made from time to time by the Forest Utilization Officer, should be adhered to.

434. *Control of fellings.*—For the fellings, the forms and registers prescribed in the Madras Forest Department and Account Code should be maintained. These are Code Forms 3, 4 and 5. The registers and the depots would be inspected by the District Forest Officer or his assistant at least once a year, and the fellings and conversion supervised as often as possible. At the end of each year's operations, an extract should be prepared showing the number of trees felled, the percentage of hollowness, and the yield of sleepers and filed with the control journal for the working circle and submitted with it to the Conservator.

435. *Order of felling.*—On account of the proposed extraction system, the following sequence of working the coupes will be adopted : Coupes VII, X, IX and VIII.

436. *Forecast of yield.*—The yield as forecast by Mr. Sarma is given in the subjoined statement :—

Statement showing the probable yield of sleepers in the coupes of the Kalar Felling Series.

Particulars.	Coupe number.	Girth classes. 7′–8′.	8′–9′.	9′–10′.	10′–11′.	11′–12′.	12′–13′.	13′–14′.	14′–15′.	Total.
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
Number of trees expected	VII	660	372	164	95	32	..	..	..	1,323 trees.
Number of trees expected to be sound	VII	425	256	118	69	21	..	..	..	889 ,,
Gross volume of sleepers in cubic feet	VII	33,150	25,344	13,983	9,246	3,056	..	..	..	84,779 c.ft.
Net outturn of sleepers in cubic feet	VII	15,174	10,905	5,751	3,726	1,227	..	..	..	36,783 ,,
Net outturn of sleepers in number of broad-gauge sleepers.	VII	5,058	3,635	1,917	1,242	409	..	..	..	12,261 ,,
Number of trees expected	VIII	726	401	153	98	37	6	..	..	1,421 trees.
Number of trees expected to be sound	VIII	467	276	90	72	24	3	..	..	932 ,,
Gross volume of sleepers in cubic feet	VIII	36,426	27,335	10,665	9,648	3,402	509	..	..	88,075 c.ft.
Net outturn of sleepers in cubic feet	VIII	16,674	9,357	4,386	3,888	1,404	216	..	..	35,925 ,,
Net outturn of sleepers in number of broad-gauge sleepers.	VIII	5,558	3,119	1,462	1,296	468	72	..	..	11,075 ,,
Number of trees expected	IX	647	337	179	130	70	..	..	..	1,366 trees.
Number of trees expected to be sound	IX	416	232	129	95	46	..	..	..	918 ,,
Gross volume of sleepers in cubic feet	IX	32,448	22,968	15,287	12,730	6,693	..	..	..	90,126 c.ft.
Net outturn of sleepers in cubic feet	IX	14,850	9,882	6,288	5,630	2,691	..	..	..	38,841 ,,
Net outturn of sleepers in number of broad-gauge sleepers.	IX	4,950	3,294	2,096	1,710	897	..	..	..	12,947 ,,
Number of trees expected	X	719	392	202	139	81	..	..	3	1,536 trees.
Number of trees expected to be sound	X	462	270	146	102	53	..	..	2	1,035 ,,
Gross volume of sleepers in cubic feet	X	36,036	26,730	17,301	13,668	7,712	..	..	336	101,783 c.ft.
Net outturn of sleepers in cubic feet	X	16,494	11,502	7,116	5,508	3,099	..	..	141	43,860 ,,
Net outturn of sleepers in number of broad-gauge sleepers.	X	5,498	3,834	2,372	1,836	1,033	..	..	47	14,620 ,,

SECTION 7.—EXPERIMENTAL ARTIFICIAL REGENERATION—KARIANSHOLA FELLING SERIES.

437. *General.*—Artificial regeneration in shola forests has engaged the attention of the Forest department for some time, with a view to introduce the more valuable species into them. Experiments conducted by the Provincial Silviculturist at Chandanathode in the Wynaad and in the Karianshola in the Coimbatore South division have indicated the lines on which success may be assured. Meanwhile, if the results are applied on a somewhat larger scale than is possible in experimental gardens, valuable experience will be available for application when operations are undertaken on an extensive scale in future. It is therefore proposed to start large scale experimental plantations of evergreen species in the Karianshola. Constant contact with the Provincial Silviculturist should be maintained so that his latest technique may be followed.

438. *Locality.*—The plantations will be made in the Karianshola. Since on this shola depends largely the already precarious water-supply for a considerable portion of the Tunacadavu range it is desirable not to endanger this supply by undertaking any extensive tampering with the shola. Experiments will be confined to areas below the reservoir which supplies the Topslip settlement.

439. *Annual area.*—An extent of 5 acres a year will be planted for the first five years. If the results prove encouraging, the annual planting area will then be increased to 10 acres.

440. *Species to be planted.*—*Artocarpus hirsuta*, *Cedrela toona*, *Dipterocarpus indicus*, *Diospyros assimilis*, *Hardwickia pinnata*, are prescribed as suitable for planting. *Swietenia macrophylla* is also suggested but should not be planted with *Cedrela toona* or in a locality where *Cedrela toona* abounds, since this species is the breeding place of the mahogany collar borer. Other species may be used in consulation with the Provincial Silviculturist.

441. *Preparation of site.*—The area will be prepared for planting by the removal of the trees and shrubs of the lower and middle canopy, leaving the full shade of the top canopy intact. Slash will *not* be burnt.

442. *Nursery.*—A nursery will be necessary. No details need be given since the annual planting area is small.

443. *Planting.*—Stumps and cuttings of *Cedrela toona* have given good results, cuttings being made from one year old plants cut 6 inches long and planted vertically. Stumps will be used for *Artocarpus hirsuta*. Transplants have been found to do well in the case of most of the other species recommended. *Gluta* is best sown direct.

444. *Planting with cardamoms.*—At the discretion of the management either the whole or half of the area will be planted with cardamom plants at an espacement of 9 feet by 9 feet. The tree species may then be planted in alternate quincunx with the cardamoms at an espacement of 18 feet by 18 feet.

If half is to be planted without cardamoms, there will be espacement of 12 feet by 12 feet for two species. Other suitable espacements may be tried at the discretion of the District Forest Officer.

445. *Time of planting.*—The middle of June will be found suitable for planting. Seeds may be dibbled early in June, unless otherwise prescribed by Provincial Silviculturist.

446. *Tending.*—No intensive tending will be required under top canopy conditions, but a weeding in the year of planting will be found beneficial. What tending may be required in areas planted along with cardamoms can only be discovered by experience.

SECTION 8.—CONTROL.

447. *Control records.*—The control forms will consist of control of fellings, record of yield from fellings, control of regeneration operations and record of works. A regeneration ledger and a nursery ledger will be maintained.

448. *Report to Chief Conservator.*—A report on the results achieved should be submitted to the Chief Conservator of Forests at the end of the fourth year and his orders obtained on the expansion or discontinuance of this project.

CHAPTER V.—WORKING PLAN FOR THE FUEL WORKING CIRCLE.

SECTION 1.—GENERAL CONSTITUTION OF THE WORKING CIRCLE AND CHARACTER OF THE VEGETATION.

449. *General constitution.*—The fuel working circle has been constituted so as to include the most accessible portions of the outer slopes of the hills. All areas along the

Consr.W.P.O. Ref 958/52 Td 26.9.52 ; Ce.P. His 37 / 19.1.53

(i) Chapter IV: Working Plan for the Evergreen Selection Working Circle:

Delete: Paras 437 to 448.

outer reserve boundaries containing growth suitable for exploitation have been absorbed in this working circle. Its total extent is 20,775 acres and it is distributed over the Pollachi and Udumalpet ranges.

450. *Character of the vegetation.*—The working circle may be divided into two distinct zones depending mainly on the variation in annual rainfall. The felling series situated near Sethumadai (Keerapadi, Pothamadai, Gudaravalli, Ayerangal and Pachathanni series) receive an annual rainfall of about 40 inches, distributed between the two monsoons, while the rest receive only about 25 inches in the year and that mainly in the north-east monsoon. This has a marked influence on the vegetation of the two zones. In the felling series near Sethumadai, the trees are up to 40 or 50 feet in height, and consist of deciduous species such as *Dalbergia latifolia*, *Terminalia tomentosa*, *Terminalia paniculta*, *Grewia tiliæfolia*, *Albizzia odoratissima*, *Schleichera trijuga*, *Stereospermum chelonoides*, *Dillenia pentagyna*, *Anogeissus latifolia*, *Pterocarpus marsupium*, *Adina cordifolia*, *Stephegyne parvifolia*, *Bauhinia racemosa*, and some teak. Bamboos (both *Bambusa* and *Dendrocalamus*) are fairly abundant, weed-growth is heavy and lantana dense.

In the felling series situated further eastwards, the vegetation is of the open scrub type. Trees are rarely more than 25 feet in height and thorny species preponderate. *Acacia leucophlœa*, *Acacia latronum*, *Acacia ferruginea*, *Dichrostachys cinerea*, *Carissa carrandas* and *Carissa spinarum*, *Zizyphus xylopyrus*, *Albizzia amara*, *Hardwickia binata*, *Melia indica*, *Sapindus emarginatus*, *Tamarindus indica*, *Gmelina asiatica*, *Balsamodendron berryi*, *Protium caudatum*, *Gyrocarpus jacquinii*, *Dolichandrone* sp., and *Balanites roxburghii* are the common species—Lantana is absent, but *Acalypha fruticosa* is common and grass is often found.

SECTION 2.—DIVISION OF THE AREA.

451. *Felling series.*—The fuel working circle has been divided into twelve felling series so as to distribute the centres of work and reduce the unit of exploitation (the coupe) to a manageable limit. Seven of the felling series lie in Pollachi range and four in Udumalpet range, one being common to both.

452. *Reconstitution.*—Kottur felling series has been reconstituted by deleting areas in Villoni valley and adding other suitable areas. Dhali series has been reconstituted by the omission of disreserved areas and the inclusion of areas near Elumalayankoil.

453. *Statement of felling series.*—The following statement gives the names and areas of the felling series and the rotation under which they are worked.

Statement of fuel felling series—Coimbatore South division.

Range.	Felling series.	Area of series.	Area of average coupe.	Rotation.
		ACS.	ACS.	YRS.
Pollachi	Pothamadai ..	959	32	30
Do.	Keerapadi	570	19	30
Do.	Gudaravalli	986	36	30
Do.	Ayerangal	1,175	39	30
Do.	Pachathanni ..	1,049	35	30
Do.	Kottur	1,736	43	40
Do.	Nallar	1,221	31	40
Udumalpet	Dhali	2,608	65	40
Do.	Kamanuthu.. ..	3,461	87	40
Do.	Chinnar	3,085	77	40
Do.	Amaravathi ..	2,522	63	40
Do.	Navalodai	1,403	35	40
	Total ..	20,775		

Note.—Nallar felling series lies partly in Pollachi range and partly in Udumalpet.

SECTION 3.—METHOD OF TREATMENT.

454. *Silvicultural system.*—The " simple coppice " system in force will be continued since it has been found to satisfy the objects of management. But tamarind and soapnut (*Sapindus*) trees inside the coupes shall not be felled unless they are old or unsound trees which have ceased to bear and have been specially permitted to be felled by the District Forest Officer. Natural coppice regeneration will be supplemented by artificial regeneration by " ponam."

455. *Rotation.*—No data are available for fixing the rotation with reference to maximum fuel production. Two distinct quality classes could be recognized as mentioned in paragraph 450 above. Mr. A. N. Sarma fixed a rotation of 30 years for areas of superior quality and one of 40 years for the inferior areas and this is in agreement with the rotation generally adopted in modern working plans in the Province. These rotations will be continued since there is nothing to indicate that they need alteration. The rotation for each series is given in the statement under paragraph 453.

456. *Regulation of working.*—The working will be regulated on the basis of equal areas, the average area of the annual coupe being the area of the felling series divided by the rotation concerned.

457. *Method of executing fellings.*—One coupe in each of the felling series will normally be felled every year. The sequence of coupes is indicated in the management maps and should be adhered to. Incompletely felled coupes may be worked, with the coupe of the succeeding year. If a coupe is not worked in the year allotted to it, it may be worked in the next year together with the coupe of the year but the fact must be noted in the Control Journal. Arrears should also be noted in the Control Journal, giving reasons.

458. *Deleted.*

SECTION 4.—EXPLOITATION.

459. *Agency of fellings.*—The coupes will be worked through the agency of contractors in accordance with the prevailing practice. Extension of lease periods should be very exceptional considering the artificial regeneration prescribed below.

460. *Demarcation and survey.*—Coupes should be demarcated by cleared lines 10 feet wide and surveyed accurately, distances being measured horizontally. Sketches should be submitted to the District Forest Officer in January well in advance of sales. Each coupe should be divided into an even number of strips, which may conveniently be four. A sketch of the coupe will be filed with its regeneration ledger. Small variations between the areas shown on the management map and the surveyed areas will not involve deviations requiring sanction.

461. *Leases.*—The right to clearfell and remove all standing growth in the coupe should ordinarily be sold in public auction and the coupe should be conveyed to the purchaser before the 1st of April, the lease period being twelve months commencing with the official year. The lessee of a coupe which is to be artificially regenerated should be bound to complete felling and removal in one half of the coupe before the end of August so that its regeneration may be taken in hand during the following north-east monsoon, if found desirable.

462. *Felling rules.*—The following rules will normally be observed when felling a coupe, but they may be varied with the approval of the Conservator :—

(*a*) Felling should proceed systematically from strip to strip. The contractor should complete fellings satisfactorily in one strip before he may be permitted to fell the next one. If the coupe is to be artificially regenerated, felling and removal should be completed over one half of the coupe before the end of August and the area handed over to the department for regeneration.

(*b*) All woody growth shall be felled *as low as reasonably possible* except that (i) no tamarind or soapnut (*Sapindus*) tree or sapling shall be cut except such old or unsound trees expressly permitted by the District Forest Officer and (ii) soft-wooded species like *Gyrocarpus*, *Givotia* and *Euphorbia* may be cut about 2 feet from ground level and the bark must be peeled off all round the stem in order to discourage coppice regrowth.

(*c*) Sharp implements should be used for felling so that the cut may be clean and the bark may not be separated from the wood. No separate trimming of the stump (apart from what is done during the process of felling) should be permitted, as a rule.

(*d*) All thorny shrubs and climbers should be cut back to ground level.

(*e*) Timber in the log and sawn or converted timber should be kept at stump-site, until it has been hammermarked and passed by the Range Officer.

(*f*) No removal of firewood in cartloads shall be permitted without prior billeting and stacking. The size of the stacks should as a rule be uniform for one coupe.

(*g*) Branchwood less than 12 inches in girth and bamboos may be removed in head-loads without billeting and stacking, subject to such restrictions as the District Forest Officer may impose in cases where sufficient brushwood is not likely to be left behind to secure a good burn for regeneration purposes.

(*h*) In the case of a coupe to be taken up for ponam regeneration, it will be the duty of the ponamdars to cut and heap up at their cost, all brushwood for a *general burn* over the area to be regenerated. If the right to do " ponam " is put up for auction along with or just before the sale of fuel coupes it should be possible to determine beforehand the coupes which will assuredly come under " ponam " regeneration.

(*i*) Bamboos found inside a fuel coupe are the property of the fuel coupe contractor : they may be felled by him in accordance with the felling rules for fuel coupes.

463. *Statement of fellings.*—The prescribed annual statement of fellings in the Fuel Working Circle is given below for the next 15 years :—

Statement of sequence of coupes to be worked in the Fuel Working Circle.

Probable year of working.	Name of the Felling Series. Pothamadai.		Keerapadi.		Gudaravalli.		Ayerangal.		Pachathanni.		Kottur.	
	Coupe number.	Area on the map.	Coupe number.	Area on the map.	Coupe number.	Area on the map.	Coupe number.	Area on the map.	Coupe number.	Area on the map.	Coupe number.	Area on the map.
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
		ACS.		ACS.		ACS.		ACS.		ACS.		ACS.
1941–42	XXI	30·8	X	19	XXI	32	XXI	38·8	XII	35·2	XXI	38
1942–43	XXII	28·8	XI	19	XXII	32	XXII	45·2	XIII	33·2	XXII	45
1943–44	XXIII	27·6	XII	19	XXIII	32	XXIII	45·6	XIV	37·6	XXIII	44
1944–45	XXIV	29·2	XIII	19	XXIV	33·2	XXIV	44·8	XV	35·6	XXIV	38
1945–46	XXV	28·8	XIV	19	XXV	33·2	XXV	44·0	XVI	35·6	XXV	36
1946–47	XXVI	30·4	XV	19	XXVI	32·4	XXVI	40·0	XVII	36·4	XXVI	37
1947–48	XXVII	30·0	XVI	19	XXVII	32·0	XXVII	44·0	XVIII	34·4	XXVII	42
1948–49	XXVIII	28·8	XVII	19	XXVIII	32·4	XXVIII	44·4	XIX	35·2	XXVIII	7
1949–50	XXIX	29·2	XVIII	19	XXIX	32·8	XXIX	42·8	XX	35·2	XXIX	7
1950–51	XXX	28·8	XIX	19	XXX	55·6	XXX	40·0	XXI	33·6	XXX	7
1951–52	I	28·8	XX	19	I	24·3	I	38·1	XXII	33·6	XXXI	40
1952–53	II	26·9	XXI	19	II	29·5	II	33·1	XXIII	36·0	XXXII	41
1953–54	III	36·5	XXII	19	III	28·5	III	26·6	XXIV	36·4	XXXIII	40
1954–55	IV	35·5	XXIII	19	IV	28·0	IV	65·3	XXV	34·8	XXXIV	40
1955–56	V	39·9	XXIV	19	V	31·0	V	28·1	XXVI	37·2	XXXV	41

Probable year of working.	Name of the Felling Series—*cont.* Nallar.		Dhali.		Kamanuthu.		Chinnar.		Amaravathi.		Navalodai.	
	Coupe number.	Area on the map.	Coupe number.	Area on the map.	Coupe number.	Area on the map.	Coupe number.	Area on the map.	Coupe number.	Area on the map.	Coupe number.	Area on the map.
	(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)	(22)	(23)	(24)	(25)
		ACS.		ACS.		ACS.		ACS.		ACS.		ACS.
1941–42	XII XIII	36·0 35·6 }	XVIII	68·0	XXII	112·0	VII	70·4	XXII	72·8	VII	38·4
1942–43	XIV	35·2	XIX	73·6	XXIII	112·0	VIII	74·4	XXIII	71·2	VIII	37·6
1943–44	XV	36·0	XX	70·0	XXIV	108·8	IX	72·4	XXIV	72·0	IX	36·4
1944–45	XVI	24·8	XXI	72·0	XXV	112·0	X	65·0	XXV	72·8	X	36·4
1945–46	XVII	25·2	XXII	70·4	XXVI	84·0	XI	76·8	XXVI	61·6	XI	36·4
1946–47	XVIII	32·8	XXIII	69·2	XXVII	77·2	XII	82·0	XXVII	64·0	XII	44·0
1947–48	XIX	34·0	XXIV	69·2	XXVIII	80·0	XIII	87·2	XXVIII	60·0	XIII	36·0
1948–49	XX	30·8	XXV	64·8	XXIX	80·0	XIV	64·8	XXIX	63·2	XIV	36·4
1949–50	XXI	32·0	XXVI	62·8	XXX	72·0	XV	83·6	XXX	62·8	XV	33·6
1950–51	XXII	32·8	XXVII	64·4	XXXI	72·9	XVI	86·0	XXXI	55·2	XVI	33·6
1951–52	XXIII	32·0	XXVIII	60·0	XXXII	72·8	XVII	78·2	XXXII	64·4	XVII	41·2
1952–53	XXIV	32·0	XXIX	62·0	XXXIII	72·8	XVIII	68·8	XXXIII	59·2	XVIII	36·4
1953–54	XXV	29·6	XXX	60·0	XXXIV	71·2	XIX	57·6	XXXIV	60·0	XIX	38·8
1954–55	XXVI	28·0	XXXI	53·0	XXXV	72·0	XX	70·8	XXXV	54·0	XX	35·6
1955–56	XXVII	31·2	XXXII	62·0	XXXVI	78·4	XXI	72·0	XXXVI	44·0	XXI	33·2
			(*a*) and (*b*)									

SECTION 5.—REGENERATION.

464. *Necessity for artificial regeneration.*—The forests in the Fuel Working Circle are generally understocked and sometimes open. Lantana forms dense thickets in places and a softwooded valueless species like *Gyrocarpus jacquinii*, *Balsamodendron berryi*, *Protium caudatum*, *Moringa pterygosperma* and *Dalbergia paniculata* form a considerable proportion of the crop. Natural regeneration from seed is deficient and death of coppiced stools requires replacement. Artificial regeneration is therefore absolutely necessary in order to prevent deterioration and to augment the value of the growing stock.

465. *Ponam and rab regeneration.*—The artificial regeneration of fuel coupes by "ponam" and "rab sowings" was prescribed by Mr. A. N. Sarma and has been in vogue for the last 4 or 5 years. The results have been encouraging, particularly so in the case of "ponam" regeneration which has been popular in the Keerapadi, Ayerangal, Gudaravalli and Pothamadai series. Ponamdars have taken up areas for regeneration along with field crops for a period of three years and have contracted to pay the department a rent of as much as Rs. 5 per acre per year for the privilege. The chief crops raised are ragi (*Eleusine coracana*) and cotton.

The regeneration of fuel coupes along with field crops (ponam regeneration) should be encouraged to the fullest possible extent since it is the cheapest and most effective way of restocking them. No rab sowings are prescribed in this plan.

466. *Area to be regenerated.*—As large a part of each coupe as it suitable for ponam regeneration should be taken up for such regeneration either in the year of felling (during the north-east monsoon) or in the succeeding year (during the south-west monsoon). The District Forest Officer will decide the time of regeneration and the extent to be taken up, with reference to local conditions and season.

467. *Choice of species.*—The species which have been used for regeneration in the past are *Acacia arabica*, *Acacia ferruginea*, *Acacia leucophlœa*, *Acacia planifrons*, *Cassia siamea*. *Albizzia lebbek*. *Albizzia amara*, *Melia indica*, *Tamarindus indica*, *Sapindus emarginatus* and some teak.

The fuel value of *Cassia siamea* is problematic, and it is subject to attack by a borer: it is desirable to substitute better species for this. *Acacia planifrons* shows unusually good growth in the fuel coupes of Pollachi range and is likely to take up a disproportionately high crown-space in good quality areas: it is suggested that its introduction may be confined to those fuel series which are worked under a rotation of forty years and to rocky slopes deficient of soil. It is desirable to restrict the use of *Tamarindus indica* and *Sapindus* so that the whole of a fuel coupe may not ultimately be converted into a tamarind or soapnut tope; small concentrated areas may be dibbled pure with soapnut and tamarind, where suitable, so as to form separate units within a coupe.

A list of recommended species is appended with notes about time of collection, weight of seeds, etc. :—

Species.	Time of collection.	Number of seeds per oz.	Remarks.
Acacia arabica	February-March	200	Black soils.
Acacia ferruginea	September	157	Medium and good soils: fast grown.
Acacia leucophlœa	April-June	1,300	All soils, particularly clayey loam.
Acacia planifrons	July-September	600	Particularly good for poor, rocky soil on hill slopes.
Albizzia lebbek	March-June	200	Grows from cuttings, fast grown.
Albizzia amara	January-March	400	Good fuel and small timber.
Albizzia odoratissima	February-April	..	....
Prosopis spicigera	June-August	740	Suited for dry localities.
Melia indica	June-August	160	Sow freshly collected seeds.
Chloroxylon swietenia	May-August	3,200	Use fresh seed.
Tamarindus indica	March-May	30	Confine to selected places.
Pithecolobium dulce	May-July	..	Suited to sandy places.
Dolichandrone falcata	April-June	1,000	Not eaten by animals.
Sapindus emarginatus	February-April	25	Confine to selected places.
Tectona grandis	December-February	50	Recommended for ponam areas in Keerapadi, Gudaravalli, Ayerangal and Pothamadai series.

468. *Teak.*—In coupes to be regenerated along with field crops, it is suggested that teak be introduced by stump-planting at intervals of about 22 feet along the lines of seedlings. The teak will receive proper tending for two or three years after which it can be left to take care of itself. Pothamadai, Keerapadi, Gudaravalli and Ayerangal series appear to be particularly suited for the introduction of this species. The presence of teak is likely to result in considerably increased prices, as in the case of Walayar, when the regenerated coupes come up for sale after 30 years.

469. *Seed collection and storage.*—Suitable arrangements will be made by the District Forest Officer for the collection and storage of the large quantities of seeds that will be required for the regeneration operations prescribed. The annual report of the Provincial Silviculturist will be of considerable help in this connexion. It may be emphasized that indenting for seeds on other districts should be reduced to the unavoidable minimum.

Ponam regeneration.

470. *General.*—The practice of "ponam" regeneration has become popular in the division, especially in the fuel series near Sethumadai in Pollachi range. In this range, coupes in Pothamadai, Keerapadi and Ayerangal series have been leased out for ponam regenertion for a period of three years for rentals varying from Rs. 3 to Rs. 5 per acre per annum. The system should therefore be introduced in as many series as possible.

471. *Regeneration.*—The method of ponam regeneration followed in the division will be continued, in the main, with such modifications as may be found desirable with increasing experience. The following points are noticed for guidance :—

(1) The area to be leased out should be surveyed beforehand and a sketch should be attached to the agreement entered into between the ponamdar and the District Forest Officer.

(2) The area should be handed over to the ponamdar in sufficient time—to be fixed beforehand—to enable him to cut and burn the area and prepare the soil before the sowing season.

(3) The ponamdar shall cut any standing growth (except trees reserved under paragraph 454) and pile it in convenient heaps, together with the slash left behind by the coupe contractor, but not too near the reserved trees to cause them injury when burning. The slash will then be burnt by him, care being taken to prevent the fire from escaping into the neighbouring forest. The ponamdar will not be required to respect or protect coppice shoots or natural seedlings outside the 4 feet strips referred to in paragraph (5) below.

(4) The ponamdar shall then plough or otherwise prepare the soil over the whole area for the purpose of growing field crops. Where no ploughing is possible, hoes or other implements may be used in such manner as is common practice in the locality.

(5) The department will demarcate on the area strips of worked up soil, four feet wide and twenty-two feet from centre to centre, for the reception of seeds of tree species. The strips will run along the shorter edge of the area on the level but along contours on slight slopes. The strips will be staked at either end and numbered.

(6) The ponamdar shall supply labour to the department whenever required for demarcation, sowing and resowing, at daily wages to be fixed beforehand.

(7) The seeds of tree species will be dibbled in two lines one foot apart, in the middle of the four feet strips mentioned in clause (5) above. The species to be dibbled will be selected by the District Forest Officer from the list recommended in paragraph 467 above. The dibbling will be done departmentally when necessary and according to weather and season.

(8) The ponamdar may grow any agricultural crop he wishes to raise in between the four feet strips reserved for tree species. Future observation will decide which crops are beneficial to the tree seedlings and which are injurious. Suitable restrictions may then be imposed.

(9) The ponamdar shall take care of the tree seedlings in the strips and shall keep them weeded to their full width, free of cost, until he vacates the area.

(10) No damage to the tree seedlings should result during the preparation of the soil by the ponamdar for subsequent crops in the first, second or third years.

(11) If future experience shows that ponam cultivation for three years is distinctly injurious to the tree crop, it should be restricted to such period as may be found to cause no noticeable setback.

(12) The ponamdar shall be bound to do a soil working round the tree seedlings, at his cost, before he finally vacates the area.

(13) Where ponamdars are not prepared to do ponam regeneration free or on payment of a rent to the department, the department may invite ponamdars to take up the work on condition that they are paid for successful regeneration at rates to be fixed per acre beforehand. The District Forest Officer may fix the amount to be so paid, in consultation with the Conservator, subject to a maximum of Rs. 5 per acre.

(14) The ponamdars may be required by the District Forest Officer to sow seeds of good fodder grasses along with the sowing of his last cereal crop. The resulting grass will afford valuable fodder in a year or two and will be an incentive for the people to adopt rotational grazing suggested for introduction in Chapter VIII.

472. *Tending.*—The regeneration area will be tended free of cost by the ponamdar until he relinquishes it. Thinning out of crowded groups of seedlings should be done departmentally when required.

473. *Deleted.*

SECTION 6.—MISCELLANEOUS REGULATIONS.

474. *Demarcation.*—The coupes will be demarcated with stones at the salient corners, engraved as usual with the number of the coupe and the year of felling. The demarcation should refer to the area leased out, not only to that actually exploited during the year. The number of a coupe is governed by the actual sequence of fellings, so that, if the allotted sequence is revised for any reason, the number should also be revised on the ground and on the map so as to agree with the revised sequence.

475. *Supply of local demand.*—The coupe contractor shall be required, under the agreement, to sell at the coupe firewood, thorns, agricultural implements and small timber to ryots for *bona fide* domestic or agricultural purposes. The retail rates will be fixed by the District Forest Officer from time to time.

476. *Statistics.*—Every contractor shall be required to furnish monthly statements of :—

(1) the quantity of fuel felled and stacked during the month, in stacks of specified dimensions;

(2) the quantity of fuel, in cart-loads or by weight, actually removed from the coupe during the month;

(3) the species, descriptions and volume of timber extracted; and

(4) the quantity of fuel sold in head-loads.

477. *Grazing.*—Felled coupes will continue to be normally closed to general grazing for a period of ten years, including the year of felling, in view of the artificial regeneration prescribed. But restricted rotational grazing in special blocks may be permitted after the lapse of four years, if the Conservator is satisfied that there is sufficient grazing in the

area to prevent cattle from being tempted by the young regeneration. Details about the rotational grazing contemplated will be found in Chapter VIII of Part II of this plan. All closed areas should be clearly distinguished by painting the reserve pillars red on the common boundaries or by prominent notice boards painted half red and half white in the recognized manner. The marks should be shifted to the proper places as areas are closed or opened year after year.

478. *Fire protection.*—No special fire protection is considered necessary.

479. *Control.*—A control of fellings, a record of yield and a control of regeneration operations are prescribed. Duplicate sets of these forms will be supplied to the District Forest Officer.

CHAPTER VI.—WORKING PLAN FOR THE BAMBOO WORKING CIRCLE.

SECTION 1.—GENERAL CONSTITUTION OF THE WORKING CIRCLE AND CHARACTER OF THE VEGETATION.

480. *General constitution.*—The Bamboo Working Circle consists of all the bamboo-bearing areas of the division which can be worked at a profit. It overlaps the Conversion, Deciduous Selection and Fuel Working Circles, partly or fully, and is distributed over all the four ranges.

481. *Area excluded.*—In the Udumalpet range, the area north-east of the Ten-ar and south of the Kaludakatti-odalai has been excluded from this working circle because the bamboos there cannot at present be exploited at a profit without an expensive cart-track and because it is considered undesirable to disturb the white bison which frequent the place. The Palacadavu and Ulandi blocks of Tunacadavu range have also been excluded from working owing to their inaccessibility : the bamboos flowered and died here between 1933 and 1938.

482. *Character of the vegetation.*—Both *Bambusa arundiancea* and *Dendrocalamus strictus* occur, the former in moist localities, particularly along the banks of streams. In the Tunacadavu range there are vast areas of almost pure *Bambusa* which have resulted from their general seeding and death between 1926 and 1930. Some patches on the outer slopes and on the Vengoli ridge which seeded earlier—in 1918–19—now contain exploitable bamboo of mature dimensions, but the major part of the area is covered by young bamboo in various stages of development which are expected to become exploitable in 3—7 years.

SECTION 2.—METHOD OF TREATMENT.

483. *Silvicultural system.*—Following the usual prescriptions for bamboo working in modern Madras Working Plans, selection thinning among the culms will be the system of working. The correct method of making thinnings in bamboo clumps is still under investigation and when definite results have been achieved the method prescribed may be suitably altered. Should a general flowering take place in any locality—there is no record of past general flowering outside the Tunacadavu range—it will be necessary to accelerate the exploitation of the bamboos and therefore to set aside the present prescriptions for the locality. Felling series in which the bamboo is not mature enough for extraction will lie over till the bamboo attains maturity.

484. *Felling cycle.*—A felling cycle of three years will be prescribed, which is the period generally adopted for the working of bamboos in this province.

485. *Felling series.*—The working circle will be divided into fourteen felling series so as to distribute the centres of supply. The distribution and areas of the series are given below :—

Range.	Survey number.	Name of felling series.	Area in acres.
Pollachi	1	Pothamadai	2,715
Do.	2	Ayerangal—Upper	2,490
Do.	3	Do. Lower ..	1,283
Do.	4	Pachathanni	4,028
Do.	5	Villoni	6,487
Do.	6	Thadaganachi	12,410
Punachi	7	Punachi	5,510
Udumalpet	8	Pundi Vendayam	15,124
Do.	9	Easalthittu Mange-Ar ..	6,802
Do.	10	Thalinji	925
Do.	11	Manjampatti	5,346
Tunacadavu	12	Top slip	5,799
Do.	13	Tekkadi	4,213
Do.	14	Tellikal	7,861
		Total ..	80,993

486. *Regulation of working.*—The yield will be regulated by area, each felling series being divided into three coupes. The coupes have been formed, after inspection of the bamboo stocking, so as to give approximately equal outturn. The boundaries are natural features and are indicated on the maps.

SECTION 3.—EXPLOITATION

487. *Agency of exploitation.*—The coupes will be leased to contractors. The sale may be by auction or by tender, at the discretion of the management.

488. *Leases.*—The lease will run ordinarily from the 1st of April to the 31st of March, for twelve months. The sales should be confirmed in time to complete the conveyance of the coupe before the 1st of April.

489. *Felling rules.*—The following felling rules are laid down: Rule (*a*) should be strictly enforced in bamboo coupes east of Pachathanni so as to prevent the extermination of bamboo in these localities of scanty rainfall :—

(*a*) A minimum of six mature culms shall be left in each clump; a culm will be considered mature if it is at least one year old.

(*b*) No culm which is less than a year old shall be felled.

(*c*) No culm shall be removed with the rhizome.

(*d*) Culms should be cut clean and as low as possible but not below the first internode from ground level.

(*e*) Fellings shall be made on the side of the clump opposite to that from which the largest number of new culms spring up.

(*f*) The bamboos in a fuel coupe are the property of the fuel coupe contractor of the year and may be felled as he likes.

(*g*) Bamboo clumps inside teak plantations may be felled without conforming to any of the rules laid down above as it is intended to discourage bamboo growth in them.

490. *Tabular statement of coupes and fellings.*—A statement showing the bamboo felling series and their boundaries, bamboo coupes and their boundaries, and the years of felling, is given below :—If a coupe is not sold in any one year it may be sold next year along with the coupe of that year, if the Conservator so approves. The Tellikal series is situated at a greater distance than the Topslip or Tekkadi series, extraction roads are at present inadequate, and the bamboos are still immature. Roads for this series will have been made in another five years when the bamboos are expected to become fit for use. Its exploitation will therefore not commence till 1946. The District Forest Officer may however start work here a year or two earlier if the bamboos are then sufficiently mature.

Statement of Bamboo Felling Series, South Coimbatore district, in the area covered by Working Plan.

Serial number.	Coupe number and year of felling.	Compartment number.	Area in acres.	Boundary description.
(1)	(2)	(3)	(4)	(5)
				POLLACHI RANGE.
				Pothamadai Bamboo Series.
			2,715	Felling Series boundary description— *North.*—Starting from cairn No. 1 at 903 the boundary runs eastwards along the reserve line to cairn No. 48. *East.*—Thence the boundary runs southwards along the reserve line to the point where the cart-track from Sethumadai to Ayyaswamimudi cuts the reserve line north of cairn No. 80. *South.*—Thence westwards along the cart-track to the Malabar district boundary. *West.*—Thence northwards along the district boundary to the starting point (cairn No. 1 at 903).
	I .. 1942–43 1945–46 1948–49 1951–52 1954–55	..	831	Coupe boundary— *North.*—Starting from cairn No. 1 at 903 the boundary runs eastwards along the reserve boundary line to cairn No. 48. *East.*—From cairn No. 48 southwards along the reserve boundary line up to the stream crossing the reserve line between cairn Nos. 53-a and 53-b. *South.*—Thence west along the stream running south-west to the Malabar district boundary to a point 15 chains north of 3860. *West.*—Thence north-west and north along the district boundary to the starting point.

Statement of Bamboo Felling Series, South Coimbatore district, in the area covered by Working Plan—cont.

Serial number.	Coupe number and year of felling.	Compartment number.	Area in acres.	Boundary description.
(1)	(2)	(3)	(4)	(5)
				POLLACHI RANGE—*cont.*
				Pothamadai Bamboo Series—cont.
	II 1943–44 1946–47 1949–50 1952–53 1955–56	.. ..	706	*North.*—The southern boundary of coupe No. I. *East.*—From the point where the stream cuts the reserve boundary between cairn Nos. 53-a and 53-b southwards along the reserve boundary line to cairn No. 63-C. *South.*—From cairn No. 63-C running west and south-west along the stream to the ridge, thence north westwards along the ridge to a distance of 60 chains to 3860. *West.*—Then north-west along the Malabar district boundary to the south-west corner of coupe No. I.
	III 1941–42 1944–45 1947–48 1950–51 1953–54	.. ..	1,178	*North.*—Starting from 3860 and following the southern boundary of coupe No. II to cairn No. 63-C. *East.*—Thence southwards along the reserve boundary line to a point where the cart-track from Sethumadai to Aiyaswami mudi cuts the reserve boundary line north of cairn No. 80. *South.*—Thence westwards along the cart-track to the Malabar district boundary. *West.*—Thence westwards along the Malabar district boundary to the starting point.
				POLLACHI RANGE.
				Ayerangal Upper Bamboo Series (in two separate bits).
2	..	..	2,490	Felling Series boundary description— *First bit.* *North.*—Starting from the point where the Tekkadi cart-track cuts the reserve boundary line about 30 chains west of Aiya-swami mudi the boundary runs north-eastwards along the boundary line of Tekkadi leased forest in Tunakadavu reserve to a point 21 chains south of 3,860 Kuchimalai; thence south along the Malabar district boundary line up to where the Sethumadai Ayyaswami mudi cart-track cuts the district boundary; thence east along the abovesaid cart-track to the point north of cairn No. 80 where the cart-track cuts the reserve boundary line. *East.*—Thence south along the reserve boundary line to 1,310 on the reserve boundary line, thence the boundary runs westwards and southwards keeping to the northern and western boundary of Ayerangal Fuel Felling Series to a point on the ridge about 20 chains up north-west from Anakadavu pallam stream. *West.*—Thence along the ridge 2,465, 3056 to Pandaravarai malai 4,236 (range boundary), thence north-westwards in a straight line to Kattadi mudi 2,696, thence to 2,753 along the ridge to the southernmost bend of the Tekkadi cart-track and west along the cart-track to the starting point. *Second bit.* *North.*—Starting from a point where the Anakadavu pallam cuts the Pollachi range boundary the line runs eastwards along the old Sethumadai road, up to a sharp bend in the abovesaid road, thence south-east to about 15 chains and thence due east to meet the reserve boundary line along the southern boundary of Sirkarpathi enclosure about 3 chains north of cairn No. 120. *East.*—From the lastmentioned point the boundary turns southwards and westwards along the reserve boundary up to cairn No. 123, then westwards to about 28 chains to a stream and then south along the stream to its source on the range boundary. *South and west.*—Follows the Pollachi range boundary to the starting point.
	I 1942–43 1945–46 1948–49 1951–52 1954–55	.. ..	1,180	Coupe boundary— *North.*—Starting from the point where Tekkadi cart-track cuts the reserve boundary line about 30 chains west of Ayyaswami mudi the boundary runs north-eastwards along the boundary line of Tekkadi leased forest in Tunakadavu reserve to a point 21 chains south of 3,860 Kuchi malai, thence south along the Malabar district boundary line up to where the Sethumadai Ayyaswami mudi cart-track cuts the boundary, thence east along the abovesaid cart-track to the point north of cairn No. 80 where the cart-track cuts the reserve line. *East.*—Thence south along the reserve boundary line to 1,310 on the reserve boundary line. *South.*—Thence from 1,310 the boundary runs westwards, southwards and eastwards keeping to the northern and western boundary of coupe III of Ayerangal Fuel Felling Series; thence along the ridge 2,064 to Pandaravarai malai 4,236. *West.*—From Pandaravarai malai 4,236 north-westwards in a straight line to Kathadi mudi 2,696, thence to 2,753 along the ridge to the southernmost bend in the Tekkadi cart-track, and west along the cart-track to the starting point.

Statement of Bamboo Felling Series, South Coimbatore district, in the area covered by Working Plan—cont.

Serial number. (1)	Coupe number and year of felling. (2)	Compartment number. (3)	Area in acres. (4)	Boundary description. (5)
				POLLACHI RANGE—*cont.*
				Ayerangal Upper Bamboo Serie (in two separates bits)—cont.
	II 1943–44 1946–47 1949–50 1952–53 1955–56	.. ..	915	*North.*—Part of the southern boundary of coupe I. *East.*—Part of the western boundary of Ayerangal Fuel Felling Series up to the point 20 chains up to the ridge from Anakadavu pallam stream. *South.*—Nil. *West.*—From the abovementioned point on the ridge the boundary runs north-west and westwards along the ridge 2,465, 3,056 to Pandaravarai malai 4,236.
	III 1941–42 1944–45 1947–48 1950–51 1953–54	.. ..	395	*North.*—Starting from a point where the Anakadavu pallam cuts the Pollachi range boundary, the line runs eastwards along the old Sethumadai ghat road up to a sharp bend in the above road, thence south-east to about 15 chains and then due east to meet the reserve boundary along the southern boundary of Sirkarpathi, about 3 chains north of cairn No. 120. *East.*—From the last-mentioned point the boundary runs southwards and westwards along the reserve boundary up to cairn No. 123; then westwards to about 20 chains to a stream and thence south along the stream to its source on the Pollachi range boundary. *South and west.*—Follows the Pollachi range boundary to the starting point.
				Ayerangal Lower Bamboo Series.
3	..	..	1,283	Felling Series boundary— *North.*—Starting from the north-west corner of coupe III of Ayerangal Fuel Felling Series the boundary runs along the coupe line eastwards to 1,310 on the reserve boundary line. *East.*—Thence turns south and east running along the reserve boundary up to the north-west corner, Sirkarpathi and thence along the western boundary of Sirkarpathi to its south-west corner. *South.*—Thence westwards and north-westwards to the southernmost bend of the old Sethumadai road, thence west along the abovesaid road to the range boundary, thence along the range boundary to the south-western corner of the felled fuel coupe No. V of Ayerangal Felling Series on the range boundary. *West.*—From the lastmentioned point the boundary runs north along the western boundary of Ayerangal Fuel Felling Series to the starting point.
	I 1942–43 1945–46 1948–49 1951–52 1954–55	.. ..	328	Coupe boundary— *North and east.*—Starting from the point where the old Sethumadai ghat road cuts the reserve boundary line between cairn Nos. 100 and 100-a, the boundary runs south along the reserve boundary up to cairn No. 104, turns east up to 108 and thence again south along the western boundary of Sirkarpathi to its south-western corner. *South.*—From the abovementioned point due west and north-west along the southern and western boundary of coupe 21 Ayerangal Fuel Felling Series where it meets the old Sethumadai ghat road. *West.*—Thence along the old Sethumadai road to the starting point.
	II 1943–44 1946–47 1949–50 1952–53 1955–56	.. ..	539	*North.*—Starting from the north-western corner of coupe 29 of Ayerangal Fuel Felling Series on its western boundary (i.e., about 100 chains north of the southernmost corner of Ayerangal Upper Bamboo Coupe II) the boundary runs eastwards and southwards and again eastwards along the western felled coupe lines of coupes 10, 9 and 8, and southern boundary of worked coupe No. 8 of Ayerangal Fuel Felling Series to the reserve line at cairn No. 94, thence along the reserve boundary line to the Sethumadai old ghat road where it cuts the reserve line between cairn Nos. 100 and 100-a. *East.*—Thence part of the old Sethumadai road forming the western boundary of coupe I of this felling series. *South.*—Thence Sethumadai old road forming part of the northern boundary of Bamboo Coupe No. III of Ayerangal Upper Bamboo Felling Series and part of the Pollachi range boundary to the point 20 chains up the ridge from Anakadavu pallam. *West.*—Thence northwards along the western boundary of Ayerangal Fuel Felling Series to the starting point.
	III 1941–42 1944–45 1947–48 1950–51 1953–54	.. ..	416	*North.*—Starting from the north-western corner of felled coupe No. 3 of Ayerangal Fuel Felling Series the boundary runs along the coupe line east to 1,310 on the reserve boundary line cairn No. 81. *East.*—From 1,310 (cairn No. 81) southwards along the reserve boundary line to cairn No. 94. *South.*—Thence west along part of the northern boundary of Bamboo Coupe No. II Ayerangal Lower Bamboo Felling Series to its north-west corner. *West.*—Thence northwards along the western boundary of the Ayerangal Fuel Felling Series to the starting point.

Statement of Bamboo Felling Series, South Coimbatore district, in the area covered by Working Plan—cont.

Serial number. (1)	Coupe number and year of felling. (2)	Compart-ment number. (3)	Area in acres. (4)	Boundary description. (5)
				POLLACHI RANGE—*cont.*
				Pachathanni Bamboo Series.
4	..	..	4,028	Felling Series boundary description— *North.*—Starting from a point about 28 chains due west of cairn No. 123 the boundary runs east to cairn No. 123, then along the reserve boundary to a point where a stream cuts the reserve boundary near cairn No. 210. *East.*—Thence south-westwards along the above said stream to 4,529, thence southwards along the ridge to a point on the range boundary 20 chains west of Nadu malai 4,712. *South.*—Thence along the Pollachi range boundary running west to a point, the source of a stream running north about 10 chains west of Kolambu malai 3,613. *West.*—Thence northwards along the abovesaid stream to the starting point.
	I 1942–43 1945–46 1948–49 1951–52 1954–55	.. ..	2,022	Coupe boundary— *North.*—Starting from the point where the Up-Ar stream cuts the reserve boundary between cairn Nos. 165 and 166 the boundary runs east along the reserve boundary to the point where a stream cuts the reserve boundary line near cairn No. 210. *East.*—Thence south-westwards along the abovesaid stream to the Station 4,529, thence southwards along the ridge to a point on the range boundary 20 chains west of Nadu Malai 4,712. *South.*—Thence southwards following the Pollachi range boundary along Sitlulakkai Malai 4,663 to the point where the Up-Ar cuts the range boundary. *West.*—Thence the boundary runs north following the Up-Ar stream to the starting point.
	II 1943–44 1946–47 1949–50 1952–53 1955–56	.. ..	1,443	*North.*—Starting from the point where a stream cuts the reserve boundary between cairn Nos. 135 and 136 the boundary runs along the reserve boundary to Up-Ar between cairn Nos. 165 and 166. *East.*—Western boundary of Coupe I of this series. *South.*—Pollachi range boundary up to the stream which forms the western boundary of this coupe cutting the reserve line between cairn Nos. 135 and 136. *West.*—The abovesaid stream.
	III 1941–42 1944–45 1947–48 1950–51 1953–54	.. ..	563	*North.*—Starting from a point about 28 chains due west of cairn No. 123 the boundary runs due east to cairn No. 123, thence along the reserve boundary up to the stream between cairn Nos. 135 and 136. *East.*—The western boundary of Coupe II of this series. *South.*—Pollachi range boundary up to a point the source of a stream running north about 10 chains west of Kolambu Malai 3,613. *West.*—Thence northwards along the stream to the starting point.
				Villoni Bamboo Series.
5	..	..	6,487	Felling series boundary description— *North.*—Starting from a point where a stream cuts the Anamalai reserve boundary between cairn Nos. 210 and 211 the boundary runs east along the reserve boundary line until the reserve boundary cuts the Ali-Ar river between cairn Nos. 320 and 321. *East.*—Thence along the Ali-Ar river up to its meeting point with the Pollachi range boundary. *South.*—Thence along the range boundary running west up to the point 20 chains west of Nadu Malai 4,712 ; thence follows the ridge to 4,529. *West.*—Thence north-eastwards along the stream to the starting point.
	I 1942–43 1945–46 1948–49 1951–52 1954–55	.. ..	1,585	Coupe boundary— *North.*—From the point where the Villoni stream cuts the reserve boundary between cairn Nos. 272 and 272-A the boundary runs east along the reserve boundary line up to 1,059. *East.*—Thence south-westwards along the Pykara Electrical line to meet the Attakatti ghat road at the second mile stand, and then keeps up the above road up to the range boundary. *South.*—Thence along the Pollachi range boundary westwards to the meeting point of the Villoni stream with the range boundary. *West.*—The Villoni stream to the starting point.
	II 1943–44 1946–47 1949–50 1952–53 1955–56	.. ..	3,534	*North.*—Starting from a point where the stream cuts the Anamalai reserve boundary line between cairn Nos. 210 and 211, the boundary runs eastwards along the reserve boundary line to a point where the Villoni odai cents the reserve forest line between cairn Nos. 272 and 272-A.

Statement of Bamboo Felling Series, South Coimbatore district, in the area covered by Working Plan—cont.

Serial number. (1)	Coupe number and year of felling. (2)	Compartment number. (3)	Area in acres. (4)	Boundary description. (5)
				POLLACHI RANGE—*cont.*
				Villoni Bamboo Series—cont.
				East.—Thence the boundary follows the Villoni odai up to the Pollachi range boundary. *South.*—Then follows the Pollachi range boundary up to the point 20 chains west of Nadu Malai 4,712 and thence to 4,529. *West.*—From the last-mentioned point runs north-eastwards along the stream to the starting point.
	III 1941–42 1944–45 1947–48 1950–51 1953–54	.. ..	1,368	*North.*—Starting from Station 1,059 on the reserve boundary line the boundary runs eastwards along the reserve line to the point where it cuts the Ali-Ar river between cairn Nos. 320 and 321. *East.*—Thence the Ali-Ar river up to where it meets the Pollachi range boundary. *South.*—Then the portion of the range boundary up to its meeting point with the Attakatti ghat road. *West.*—The eastern boundary of bamboo coupe No. I.
				Thadaganachi Bamboo Series.
6	..	..	12,410	Felling series boundary description— *North.*—Starting from cairn No. 365 where the Ali-Ar river cuts the Anamalai reserve line the boundary runs north and east along the reserve boundary line up to cairn No. 570. *East.*—From cairn No. 570 along the Anamalai reserve line southwards to cairn No. 660, thence turning eastwards and northwards up to cairn No. 679 to meet the Nal-Ar, thence along the Nal-Ar to its meeting point with the Pollachi range boundary near 1,522. *South.*—Part of the Pollachi range boundary up to Ali-Ar-river, thence the Ali-Ar river up to cairn No. 321. *West.*—Thence along the reserve boundary line to the starting point.
	I 1942–43 1945–46 1948–49 1951–52 1954–55	.. ..	2,068	Coupe boundary— *North.*—Starting from the point cairn No. 365 where the Ali-Ar cuts the Anamalai reserve line the boundary runs north and eastwards along the reserve boundary line up to Kundurutti-pallam, where it cuts the reserve line at cairn No. 490. *East.*—Thence turning due south along the stream to the main water-shed running along 4,594, 3,973, 3,523, 3,160, 3,030, 2,841, 3,052 and 2,948. *South.*—From the abovementioned point 2,948 in a straight line westwards along the Pollachi range boundary to Ali-Ar crossing Navamulai Malai 2,985. *West.*—Part of Ali-Ar river and thence along the reserve boundary line to the starting point.
	II 1943–44 1946–47 1949–50 1952–53 1955–56	.. ..	6,100	*North.*—From the point where the Kundurutti pallam cuts the reserve boundary (cairn No. 490), the boundary follows the reserve line. *East.*—Thence part of the reserve boundary line up to the junction of Puliampatti-Ar and the Nal-Ar. *South.*—Thence the boundary runs westwards along the Puliampatti-Ar to its source about 10 chains north of tri-junction point 3,160. *West.*—Thence along the eastern boundary of coupe No. I to the starting point.
	III 1941–42 1944–45 1947–48 1950–51 1953–54	.. ..	4,242	*North.*—The southern boundary of coupe No. II. *East.*—From the junction of Puliampatti-Ar and Nal-Ar the boundary runs along the reserve boundary till it cuts the Nal-Ar at cairn No. 679 and thence along the Nal-Ar to its meeting point at the Pollachi range boundary near 1,522. *South.*—Part of Pollachi range boundary from 1,522 to 2,948. *West.*—Part of eastern boundary of coupe No. I.
				PUNACHI RANGE.
				Punachi Bamboo Series.
7	..	..	5,510	Felling series boundary description— *North.*—Starting from Chinakan Malai 3,483 on the Pollachi range boundary the boundary runs eastwards along the range boundary up to the junction of Pollachi, Punachi and Udumalpet ranges. *East.*—The common boundary between Udumalpet and Punachi ranges until it meets the Tunakadavu-Ar, thence the eastern boundary of the Punachi Timber Working Circle. *South.*—The southern boundary of the Punachi Timber Working Circle. *West.*—The western boundary of the Punachi Timber Working Circle until it meets the starting point.

Statement of Bamboo Felling Series, South Coimbatore district, in the area covered by Working Plan—cont.

Serial number.	Coupe number and year of felling.	Compartment number.	Area in acres.	Boundary description.
(1)	(2)	(3)	(4)	(5)
				PUNACHI RANGE—*cont.*
				Punachi Bamboo Series—cont.
	I 1942–43 1945–46 1948–49 1951–52 1954–55	.. ..	1,670	Coupe boundary— *North.*—Starting from the Chinakan Malai 3,483 on the Pollachi range boundary the boundary runs eastwards along the range boundary to where it meets the Torakadavu-Ar; thence along the Torakadavu-Ar up to the junction of Ethakulipallam. *East.*—Thence southwards along the Ethakulipallam up to its meeting point with the southern boundary of the Punachi Timber Working Circle. *South.*—Thence to Punachi Timber Working Circle line west of Ethakulipallam. *West.*—Punachi Timber Working Circle line to the starting point.
	II 1943–44 1946–47 1949–50 1952–53 1955–56	.. ..	940	*North.*—Starting from the junction of Ethakulipallam and Torakadavu-Ar the boundary runs east across the Torakadavu-Ar. *East.*—Eastern boundary of Punachi Timber Working Circle. *South.*—Southern boundary of Punachi Timber Working Circle up to Ethakulipallam. *West.*—Ethakulipallam.
	III 1941–42 1944–45 1947–48 1950–51 1953–54	.. ..	2,900	*North.*—Starting from the junction of Ali-Ar and the Pollachi range boundary running east up to the tri-junction of Pollachi, Punachi and Udumalpet ranges. *East.*—The portion of the common reserve boundary between Udumalpet and Punachi ranges up to Torakadavu-Ar. *South and west.*—Thence along the Torakadavu-Ar and Ali-Ar to the starting point.
				UDUMALPET RANGE.
				Pundivendayam Bamboo Series.
8	..	..	15,124	Felling series boundary description— *North.*—Starting from a point on the ridge about 20 chains south of 1,867, the boundary runs eastwards along the top line of Dhali Fuel Felling Series up to Manthorai-Ar. *East.*—Thence southwards along the Manthorai-Ar to Chikka Malai 3,742, Kodamurutti Malai 4,217, thence southwards to Kottai-Ar up to 4,939 on the western slope of the stream. *South.*—Thence in a straight line west to Pichi Malai 6,887, Baturava Malai 5,990 and Kokkan Malai 4,900. *West.*—From the last mentioned point the boundary runs north-westwards and northwards along Thimmigi Malai 5,159, 4,982 Kopathu Malai 4,057 and in a line due north to 3,035, thence along the Nal-Ar stream up to point 3,125, thence all along the ridge 3,497, 3,620, 3,133, and 3,577 to Kallarai Karadu 3,663, thence keeping to the ridge west of 3,905 to the starting point.
	I 1942–43 1945–46 1948–49 1951–52 1954–55	.. ..	3,854	Coupe boundary— *North.*—Starting from a point on the ridge about 20 chains south of point 1,867 the boundary runs eastwards along the top boundary of Dhali Fuel Felling Series up to a point due north of Mulaimadakku 4,025. *East.*—From the last-mentioned point southwards to Mulaimadakku and keeping along the ridge 3,986, 3,891, 9,068 to Vellai Parai 4,279 and 4,556, Varasatti Malai 5,197, and thence along the ridge to Bahirava Malai 5,990. *South.*—From the last-mentioned point the boundary runs in a straight line westwards to Kokkan Malai 900. *West.*—From the last-mentioned point the boundary run north-westwards and northwards along Timmunji Malai 5,159 and northwards to 4,982, Kopattu Malai 4,057 and in a line due north to 3,035 thence along the Nal-Ar stream up to a point 3,125, thence all along the ridge 3,497, 3,620, 3,133 and 3.577 to Kallarai Karadu 3,663, thence keeping to the ridge west of point 3,905 to the starting point.
	II 1943–44 1946–47 1949–50 1952–53 1955–56	.. ..	4,910	*North.*—From a point on the Dhali Fuel Felling Series to a line due north of Mulaimadakku 4,025, the boundary runs due east along the Fuel Felling Series boundary to a point where it meets the Pal-Ar. *East.*—Thence from the abovementioned point along the Trimurthiparai-Jallimuthanparai foot-paths; thence up to the stream due south starting from 5,928 on the southern boundary of the felling series. *South.*—From 5,928 the boundary runs in a line due west to Bahirava Malai 5,990. *West.*—Eastern boundary of coupe No. I to the starting point.
	III 1941–42 1944–45 1947–48 1950–51 1953–54	.. ..	6,360	*North.*—From the point where the top line of the Dhali Fuel Felling Series meets the Pal-Ar the boundary runs eastwards and northwards along the Fuel Felling Series line up to Manalturai-Ar.

Statement of Bamboo Felling Series, South Coimbatore district, in the area covered by Working Plan—cont.

Serial number.	Coupe number and year of felling.	Compartment number.	Area in acres.	Boundary description.
(1)	(2)	(3)	(4)	(5)
				UDUMALPET RANGE—*cont.*
				Pundivendayam Bamboo Series—cont.
				East.—Thence southwards along the Manalturai-Ar to Chikka Malai 3,742, Kudamurutti Malai 4,217, thence southwards to Kottai-Ar up to 4,939 on the western slopes of the stream. *South.*—Thence in a straight line westwards to Pichi Malai 6,887 and 5,928. *West.*—The eastern boundary of coupe No. II.
				Isaltittu Mange-Ar Bamboo Series.
	..	..	6,802	Felling series boundary description (in two bits)— *First bit.* *North.*—The Isaltittu plateau from Bodinayakkan Malai 3,467 the boundary runs east to Yelumedu Malai and Senkallu Malai 3,729. *East.*—From Senkallu Malai the boundary runs due south an imaginary line passing through Elumalaiyankoil to Peelamalai 3,391 due east of Pambu Malai 6,632. *South.*—From the last-mentioned point 3,391 the boundary runs due west to Pambu Malai 6,632. *West.*—From the last-mentioned point the boundary runs north along the ridge 6,164, 5,867 and 5,257 to Arasiamman Malai 5,654 and 3,617, Kudamurutti Malai 4,217, Chikka Malai 3,742 thence running down to Murigud-Ar and getting up the opposite slope to the starting point 3,467. *Second bit.* *North, east, south and west.*—The whole block of bamboos in and around the Mange-Ar kudi.
	I .. 1942–43 1945–46 1948–49 1951–52 1954–55	..	3,622	Coupe boundary— *North.*—The Isaltittu plateau from Bodinayakkan Malai 3,467 the boundary runs east to Yelumedu Malai. *East.*—From the last-mentioned point the boundary runs in a southerly direction along Patu Malai 4,304, Piyala Malai 4,366, 4,150 and 4,097 to a point near 4,781 on the ridge. *South.*—From the last-mentioned point the boundary runs due west along Arasiamman Malai 5,654 up to the ridge 3,617. *West.*—Thence the boundary runs northwards along the ridge Kudamurutti Malai 4,217 and Chikka Malai 3,742 running down to Murigud-Ar and getting up the opposite slope to the starting point 3,467.
	II .. 1943–44 1946–47 1949–50 1952–53 1955–56	..	2,784	*North.*—From Yelumedu Malai to Senkallu Malai and Munuganuthu. *East.*—From Senkallu Malai due south an imaginary line passing through Elumalaiyankoil to 3,391 due east of Pambu Malai 6,632. *South.*—From the last-mentioned point 3,391 due west to Pambu Malai 6,632. *West.*—From the abovementioned point northwards along the ridge 6,164, 5,867 and 5,257 to Arasiamman Malai 5,654, thence the eastern boundary of coupe No. I to the starting point.
	III .. 1941–42 1944–45 1947–48 1950–51 1953–54	..	396	*North, east, south and west.*—The whole block of bamboos in and around the Mange-Ar kudi.
				Thalinji Bamboo Series.
10	..	..	925	Felling series boundary description— *North.*—Starting from the limit of bamboo growth on the foot-path from Thalinji to Athiodai customs checking station on the Travancore side of Athiodai the boundary runs east along the edge of bamboo growth (including the strip of bamboos on either bank of Jambumalai odai) to the Ten-Ar. *East.*—From the last-mentioned point south along the Thalinji Block reserved forest boundary up to Jambumalai 4,576. *South and west.*—From the last-mentioned point the boundary runs along the Thalinji block reserved forest boundary up to where it meets the foot-path from Thalinji to Athiodai customs checking station of Travancore. This series includes the small patches of bamboos occurring along the Athiodai stream until where it meets the Pambu-Ar.
	I .. 1942–43 1945–46 1948–49 1951–52 1954–55	..	433	Coupe boundary— *North.*—An imaginary line due east and west from the small hillock shown in the map until it meets the Jambu Malai odai on the west and Ten-Ar on the east.

Statement of Bamboo Felling Series, South Coimbatore district, in the area covered by Working Plan—cont.

Serial number.	Coupe number and year of felling.	Compartment number.	Area in acres.	Boundary description.
(1)	(2)	(3)	(4)	(5)
				UDUMALPET RANGE—*cont.*
				Thalinji Bamboo Series—cont.
				East.—From the last-mentioned point southwards along the Thalinji block boundary to Jambu Malai 4,576. *South.*—Part of the southern boundary of Thalinji block up to Jambu Malai Odai. *West.*—Thence along the Jambu Malai Odai to the starting point.
	II 1943–44 1946–47 1949–50 1952–53 1955–56	..	271	*North.*—Starting from a point about 30 chains south-east of 2,461, the boundary line runs due east to Jambu Malai Odai, thence north along the limit of bamboo growth (about 2 chains width) on either side of the Jambu Malai Odai up to the foot-path from Thalinji to Manjampatti, thence turning south along the edge of bamboo growth up to the north-west corner of coupe No. I. *East.*—The western boundary of Coupe No. I. *South.*—Part of the Thalinji block reserve boundary. *West.*—An imaginary line running due north from the Thalinji block reserve boundary to the starting point.
	III 1941–42 1944–45 1947–48 1950–51 1953–54	..	221	*North.*—Starting from the limit of bamboo growth on the foot-path between Thalinji and Athi Odai customs checking station (on the Travancore side of Athi Odai) the boundary runs along the edge of the bamboo growth towards east up to the north-west corner of Coupe No. II. *East.*—The western boundary of Coupe No. II. *South and west.*—Thence along the southern boundary of Thalinji block reserve boundary line up to the foot-path from Thalinji to the Athi Odai customs station on the Travancore side and small patches of bamboo occurring along the Athi Odai stream until it meets the Pambu-Ar.
				Manjampatti Bamboo Series.
11	..	..	5,346	Felling series boundary description— *North.*—Starting from the westernmost corner of Manjampatti enclosure the boundary runs south-east along the southern boundary of Manjampatti enclosure and thence along the eastern boundary up to the point where it meets the Kumbur-Ar, thence running east along the Kumbur-Ar until where the Kumbur-Ar cuts the Kukkal Block reserved forest boundary. *East.*—From the last-mentioned point the boundary runs in a south-westerly direction along the Kukkal and Manjampatti Block reserved forest boundary up to Rettamedu Malai. *South.*—From the last-mentioned point the boundary runs west and north-west along the Majampatti Block reserved forest boundary to Vellangiri Malai 6,996. *West.*—From the last-mentioned point the boundary runs north-east along Manjampatti Block reserved forest boundary to the starting point.
	I 1942–43 1945–46 1948–49 1951–52 1954–55	..	1,460	Coupe boundary— *North.*—Starting from the westernmost corner of the Manjampatti enclosure the boundary runs south-east along the southern boundary of Manjampatti enclosure where it meets the Vattavadi-Ar. *East.*—Thence south along the Vattavadi-Ar up to its meeting point on the southern boundary of Manjampatti Block reserve forest. *South.*—Thence west along part of the southern boundary of the Manjampatti Block reserved forest up to Vellangiri Malai 6,996. *West.*—Thence along the western boundary of the Manjampatti Block reserved forest to the starting point.
	II 1943–44 1946–47 1949–50 1952–53 1955–56	..	3,002	*North and east.*—Starting from the junction of the northern boundary of the Manjampatti Block reserved forest line and the Kumbur-Ar, the boundary runs south-eastwards and southwards along the Manjampatti Block reserved forest line up to Rettamedu Malai. *South.*—Thence the boundary runs west along the southern boundary of Manjampatti Block reserved forest line up to its meeting point with the Vattavadi-Ar. *West.*—Thence north along the eastern boundary of Coupe No. I and the Manjampatti enclosure line to the starting point.
	III 1941–42 1944–45 1947–48 1950–51 1953–54	..	884	*North.*—Starting from the junction of the Kumbur-Ar with the northern boundary of the Manjampatti Block reserved forest line the boundary runs south-east along the Kumbur-Ar up to the point where it cuts the Kukkal Block reserved forest boundary. *East and south.*—Thence the boundary runs along the Kukkal Block reserved forest boundary running west up to its junction point with the Manjampatti Block reserved forest boundary. *West.*—Thence the boundary runs north along the common boundary of Manjampatti and Kukkal Blocks reserved forests to the starting point.

Statement of Bamboo Felling Series, South Coimbatore district, in the area covered by Working Plan—cont.

Serial number.	Coupe number and year of felling.	Compartment number.	Area in acres.	Boundary description.
(1)	(2)	(3)	(4)	(5)
				TUNACADAVU RANGE.
				Topslip Bamboo Series.
12	..	52 and 53 and 57 to 80.	5,799 (excluding shola).	Felling series boundary description— *North.*—Starting from Periavarai Malai at the junction of the boundaries of compartments 5, 57, 58 and 59 and the Pollachi range boundary, the boundary runs east and south-east along the said range boundary till it meets north-east corner of compartment 59. *East.*—Thence south-east and east along the said range boundary to hill height point 4,433; thence south and south-west along the west boundary of Anaimali reserved forest to Umayamalai. *South.*—Thence south-west along the ridge passing through Vellimalai and Anaigundi saddle till it meets Vengolimalai Peak. *West.*—Thence north-east and north along the boundary between Tekkadi leased forest and Mount Stuart reserved forest till it meets the south-east corner of compartment 57; thence along the southern, western and northern boundaries of the said compartment to the starting point.
	I .. 1941–42 1944–45 1947–48 1950–51 1953–54	52, 53, 70 part, 71 part, 72, 73 part and 74 to 80.	3,593 (excluding shola).	Coupe boundary— *North.*—Starting from a point on the boundary of the Tekkadi leased forest where the Anaipadi-Mount Stuart road crosses it, the boundary runs east and north along the said road towards Topslip to the junction of the boundaries of compartments 65, 66 and 70 very near 19th mile; thence north-east along the southern boundaries of compartments 65 and 64 till it meets the Pollachi range boundary. *East.*—Thence south and east along the said range boundary, i.e. from the south-east corner of compartment 64 to hill height point 4,433, thence south and south-west along the west boundary of Anaimalai reserved forest to Umayamalai. *South.*—Thence south-west along the ridge passing through Vellimalai and Anaigundi saddle till it meets Vengoli Peak at the junction of the boundary between Cochin forest, Tekkadi leased forest and Mount Stuart forest. *West.*—Thence north-east along Tekkadi leased forest boundary to the starting point.
	II .. 1942–43 1945–46 1948–49 1951–52 1954–55	64 part, 65 to 69, 70 part, 71 part and 73 part.	1,182 (excluding shola.)	*North.*—Starting from the north-west corner of compartment 67 on the boundary of Tekkadi leased forest, the boundary runs east, north-east along the northern boundary of compartments 67, 65 and 64 till it meets the Topslip-Sethumadai road; thence along the said road till it meets the Pollachi range boundary. *East and south.*—Thence east, south-east along the said range boundary to the south-east corner of compartment 64; thence west, south-west along the southern boundary of compartments 64 and 65 till it meets the Mount Stuart-Topslip road; thence east, south, east and south-west along the said road till it meets the boundary between Tekkadi leased forest and Mount Stuart reserved forest. *West.*—Thence north-east and north along the said boundary to the starting point.
	III .. 1943–44 1946–47 1949–50 1952–53 .. 1955–56	57 to 63 and 64 part.	1,024 (excluding shola.)	*North.*—Starting from Periavarai Malai at the junction of the boundaries of compartments 5, 57, 58 and 59 and the Pollachi range boundary, the boundary runs east and south-east along the said range boundary to the north-east corner of compartment 59. *East.*—Thence south-east and east the boundary runs along the said range boundary till it meets the Topslip-Sethumadai road. *South.*—Thence south, south-west along the said road till it meets the northern boundary of compartment 64 thence south-west along the northern boundary of compartments 64, 65 and 67 till it meets Tekkadi leased forest boundary. *West.*—Thence north along said forest boundary to the south-east corner of compartment 57; thence along southern, western and northern boundaries of compartment 57 to the starting point.
				Tekkadi Bamboo Series.
13		1 to 15.	4,213 (excluding shola.)	Felling Series boundary description— *North.*—Starting from the Tekkadi River at the north-west corner of compartment 2 the boundary runs along the northern boundary of Tekkadi leased forest adjoining Kollengode forest till it meets Pollachi range boundary. *East.*—Thence south and south-east along the said range boundary to Periavarai Malai. *South.*—Thence south-west along the southern boundary of compartment 5, the eastern and southern boundary of compartment 8, to the junction of the boundaries of compartments 8, 15 and 55, thence the eastern and southern boundaries of compartment 15 till it meets Olakkaneerpallam at the junction of the boundaries of compartments 15, 44, 45 and 51; thence west along the southern boundaries of compartments 15, 14, 13 and 12 till it meets Tekkadi river.

Statement of Bamboo Felling Series, South Coimbatore district, in the area covered by Working Plan—cont.

Serial number.	Coupe number and year of felling.	Compartment number.	Area in acres.	Boundary description.
(1)	(2)	(3)	(4)	(5)
				TUNACADAVU RANGE—*cont.*
				Tekkadi Bamboo Series—cont.
				West.—Thence north-east and north along the said river to the starting point.
	I .. 1941–42 .. 1944–45 .. 1947–48 1950–51 1953–54	9 to 15.	1,811 (excluding shola.)	Coupe boundary— *North.*—Starting from a point where the boundary between compartments 7 and 9 meets the Tekkadi river; the boundary runs east-wards along the northern boundaries of compartments 9, 10 and 15 till it meets the north-east corner of compartment 15. *East.*—Thence south-west along the southern boundary of compartment 15 till it meets Olakkaneerpallam at the junction of boundaries of compartments 15, 14, 45 and 51. *South.*—Thence west along the southern boundaries of compartments 15, 14, 13 and 12 till it meets Tekkadi river. *West.*—Thence north-east along the said river to the starting point.
	II .. 1942–43 1945–46 1948–49 1951–52 1954–55	5 to 8 ..	1,422	*North.*—Starting from a point where the boundary between compartments 3 and 6 meets the Tekkadi river the boundary runs east and north-east along the northern boundaries of compartments 6 and 5 till it meets Kathadimudi on the boundary of Pollachi range. *East.*—Thence south-east along the said range boundary to Periavarai Malai. *South.*—Thence south-west along the southern boundary of compartment 5, the eastern and southern boundary of compartment 8 to the junction of the boundaries of compartments 8, 15 and 55; thence south, west and north-west along the northern boundary of compartments 15, 10 and 9 till it meets the Tekkadi river. *West.*—Thence north-east and north along the said river to the starting point.
	III .. 1943–44 1946–47 .. 1949–50 1952–53 1955–56	1 to 4 ..	980	*North.*—Starting from the Tekkadi river at the north-west corner of compartment 2, the boundary runs along the northern boundary of Tekkadi leased forest adjoining Kollengode forest till it meets Pollachi range boundary. *East.*—Thence south and south-east along the said range boundary till it meets Kathadimudi. *South.*—Thence towards south-west and west along the southern boundary of compartments 4 and 3 till it meets Tekkadi river. *West.*—Thence northwards along the said river to the starting point.
				Tellikal Bamboo Series.
14	..	16 to 30, 33 to 37, 41 and 45 to 51.	7,861 (excluding shola.)	Felling series boundary description— *North.*—Starting from Tekkadi river at the north-west corner of compartment 16, the boundary runs east along the northern boundaries of compartments 16, 17, 41 and 44; thence north-east along the western boundaries of compartments 51 and 55 to the north-east corner of compartment 57; thence the western and southern boundaries of the said compartment to the boundary between Tekkadi leased forest and Mount Stuart reserved forest. *East.*—Thence south along the said boundary to Vengoli Peak. *South.*—Thence west and north-west along the boundary of the Cochin State to the junction of Itti-Ar and Tekkadi river. *West.*—Thence north-west along the latter river to the starting point.
	I .. 1946–47 1949–50 1952–53 1955–56	27, 28, 30 and 33 to 37.	2,715	Coupe boundary— *North.*—Starting from the junction of Itti-Ar and the Manjalipallam stream on the boundry of Cochin State, the boundary runs north-east along the said latter stream till it meets the north-east corner of compartment 28; thence south and south-west along the eastern boundary of compartment 28; thence south-east along the eastern boundary of compartment 30 till it meets Tunakadavu river; thence eastwards along the said river and Sichalipallam until it meets the boundary between Tekkadi leased forest and Mount Stuart reserved forest. *East.*—Thence south-west along the said boundary to Vengoli Peak. *South and west.*—Thence west and north-west along the boundary of Cochin State to the starting point.
				First bit 1.
	II .. 1947–48 1950–51 1953–54 ..	45 to 51.	2,528 (excluding shola).	*North.*—Starting from Olakkaneerpallam at the junction of compartments 45, 51 and 15 the boundary runs north-east, south and south-east along the western and the eastern boundaries of compartment 51 and the northern boundary of compartment 50 to the north-east corner of compartment 49 on the eastern boundary of Tekkadi leased forest. *East.*—Thence south and south-west along the said boundary till it meets Tunakadavu river.

C.C. Pro. Mis. 501 dt. 6.12.50

Chapter VII - Working Plan For the Minor Forest Produce Working Circle

Section 1- Constitution of the Working Circle.

Para 495 - Main items of produce.

Delete the word "and" between dammu and avarambark and insert "comma".

Delete the full stop after (Cassia auriculata) and add the following.

"and Rela bark (Cassia fistula)."

Statement of Bamboo Felling Series, South Coimbatore district, in the area covered by Working Plan—cont.

Serial number. (1)	Coupe number and year of felling. (2)	Compart-ment number. (3)	Area in acres. (4)	Boundary description. (5)
				TUNACADAVU RANGE—*cont.*
				Tellikal Bamboo Series—cont.
				South.—Thence west along the said river to the south-west corner of compartment 47; thence along the Sungam-Anaipadi road till it meets the old tram line at Puliyadi.
				West.—Thence north, north-east along the western boundaries of compartments 46 and 45 to the starting point.
				Second bit.
		41, 26 and 29.	2,528 (excluding shola).	*North.*—Starting from the north-west corner of compartment 41, the boundary runs east along its northern boundary to Olakkaneerpallam.
				East.—Thence south along the Olakkaneerpallam till it meets the north-east corner of compartment 29; thence south-east and south along the eastern boundary of compartment 29 to the junction of Karadivaraipallam and the Sungam road at Sungam.
				South.—Thence north-west and south-west along the southern boundary of compartment 29 to its south-west corner.
				West.—Thence north, north-east along the western boundaries of compartment 29 and 26; thence south-east along the northern boundary of compartment 26 till it meets the south-west corner of compartment 41; thence north along the western boundary of compartment 41 to the starting point.
	III 1948–49 1951–52 1954–55	16 to 25.	2,618	*North.*—Starting from Tekkadi river at the north-west corner of compartment 16, the boundary runs east along the northern boundary of compartment 16, thence north and west along the boundaries of compartment 17 to its north-east corner.
				East.—Thence south and north-west along the eastern and southern boundaries of compartment 17; thence south-west along the eastern boundary of compartment 25 till it meets Manjali pallam.
				South.—Thence south-west and north-west along the said Pallam to its junction with Itti-Ar on the Cochin State boundary.
				West.—Thence north-west along the said state boundary to the junction of Itti-Ar and Tekkadi river; thence north-east along the latter river to the starting point.

SECTION 4.—MISCELLANEOUS REGULATIONS.

491. *Grazing.*—The working circle will be open to grazing at all times, with the exceptions given in paragraph 503 in Chapter VIII.

492. *Fire protection.*—No special measures need be taken to fire protect the Bamboo Working Circle.

493. *Control.*—See Chapter XI for the control form concerned.

CHAPTER VII.—WORKING PLAN FOR THE MINOR FOREST PRODUCE WORKING CIRCLE.

SECTION 1.—CONSTITUTION OF THE WORKING CIRCLE.

494. *Constitution.*—The Minor Forest Produce Working Circle covers the whole of the Coimbatore South Forest Division.

495. *Main items of produce.*—The important items of minor products occurring in the division are: cardamom, shekoy, soapnut, honey and wax, gallnut, tamarind, cane, dammar, and avaram bark (*Cassia auriculata*). Other less important products are given below, but the list is by no means exhaustive:—

Botanical name.	English name.	Portion of the plant collected as M.F.P.
Mangifera indica	Mangoes	Fruit.
Phyllanthus emblica	Emblic myrobolans	„
Artocarpus integrifolia	Jack	„
Carissa carandas	*Carissa*	„
Feronia elephantum	Woodapple	„
Strychnos nuxvomica	Nuxvomica	Seeds.
Strychnos potatorum	Clearing nut	„
Solanum pubescens	Wild brinjal	Fruit.
Solanum nigrans	„	„
Terminalia belerica	Beleric myrabolans	„
Murraya Koenigii	Curry leaf	Leaf.
Cinnamomum zeylanicum	Cinnamon	Bark.
Ventilago madraspatana	Tanbark	„
Gymnema montanum	Mahali	Root.
Zingiber officinale	Ginger	„
Curcuma longa	Turmeric	„
Musa sp.	Plantain	Leaf.
Cyperus pangarai	Grass	Grass.
Trichosanthes cucumerina	Climber (Peypodal)	Whole plant.

Ivory.

Horns.

SECTION 2.—METHOD OF TREATMENT.

496. *Departmental collection.*—All ivory and horns shall continue to be collected departmentally in all the ranges and sold by the District Forest Officer to the best advantage. Honey and wax are being collected departmentally in all ranges except Punachi, since 1938–39 and sold in consultation with the Forest Utilization Officer. This procedure may be continued, if profitable, failing which the right of collection may be sold in auction. In the Tunacadavu Range, departmental collection of all minor produce will be undertaken since it will give some work and income to the local labour force when they have no other work to do, and will therefore enable them to undertake a larger extent of ponam regeneration. The malasars must be instructed not to set fire to the forest to facilitate collection of minor products and not to adulterate the produce in any way. Departmental collection will also result in increased knowledge of the economic value of minor forest produce.

497. *Punachi Range.*—The right to collect all minor produce, except ivory and horns, in the Punachi and Ulandi ranges has been leased to the Anamalai Planters' Association for a period of ten years beginning with 1933–34, for an annual rental of Rs. 1,200. The lease terminates in 1942–43. If it is decided to renew the lease in favour of the Anamalai Planters' Association, the rental should be revised with reference to the prevailing demand, and the "Ulandi Range" should be omitted from the lease since the deciduous part of it has been absorbed in the Tunacadavu Range, and its evergreen part in the Punachi Range. It will be seen from paragraph 104 that the Kadirs of Kallar valley had complained that the association was refusing to purchase certain items of minor produce which could be sold to others. It is suggested that the terms of the lease be so modified as to make it incumbent on the lessees to sublet such of the items of the produce as they do not care to buy, so that the hill tribes may sell such produce to the sub-lessee and earn a legitimate living.

498. *Gallnuts.*—The right to collect gallnuts (fruits of *Terminalia chebula*) will be leased out every year in the Udumalpet and Pollachi ranges, the unit being normally the range. The District Forest Officer may, however, subdivide the units suitably if he considers that better prices are likely to be obtained thereby. The normal period of lease is from 1st of July to 30th of June.

499. *Avaram bark.*—Avaram bark (*Cassia auriculata*) will continue to be leased out annually, the units being

(i) the porambokes, unreserves and reserves of the Udumalpet taluk; and
(ii) the unreserves and porambokes and road margins of Dharapuram taluk.

The period of lease is, normally, 1st of April to 31st of March.

499(a) See correction slip.

500. *Other minor forest products.*—All other minor products not dealt with above shall be leased out annually according to existing practice, in the Pollachi and Udumalpet ranges, separately. All items of minor products, excluding gallnuts and avaram bark, are generally leased out together but the District Forest Officer will have discretion to group them together and sell each group separately if he considers that better prices are likely to be realized thereby; for instance, it may be found more profitable to lease out tamarind separately. The most suitable lease period has been found to be from the 1st of July to the 30th of June.

501. *Euphorbia bark.*—A demand has been noticed for the bark of *Euphorbia* trees. Dry bark is used for burning lime and is reported to make excellent *lime*. It is understood that dead bark is collected off the tree without injuring it. This demand may be investigated.

502. *Control.*—The results of departmental collection and leases shall be recorded in the control form supplied with the working plan. Accounts of collection furnished by lessees in accordance with the terms of the lease should be scrutinized and every effort made to obtain accurate returns from them.

CHAPTER VIII.—WORKING PLAN FOR THE GRAZING WORKING CIRCLE.

SECTION 1.—CONSTITUTION OF THE WORKING CIRCLE.

503. *Constitution.*—The following areas are excluded from the Grazing Working Circle, under the orders of the Chief Conservator :—

(i) The Tunacadavu Range—vide C.C.P. Mis. No. 434, dated 9th September 1933.

Para 499 - Insert the following as "para 499 (a)".

"Para 499(a) - Rela bark - Rela bark (Cassia fistula) may be sold in Udamalpet, Pollachi and Punachi Ranges, except Tunacadavu Range on a three years rotation commencing from Udamalpet Range during 1950-51 as detailed below:-

C.C.Pro.Mis. 501
6.12.50

Udamalpet Range	-	1950-51.
Pollachi Range	-	1951-52.
Punachi Range.	-	1952-53 and so on".

(ii) The Punachi Range, except the Thorakadavu block, Compartment 1 of the old Punachi Working Circle and an extent of 2,924 acres as shown below—vide C.C P. Mis. No. 58, dated 6th February 1937 :—

	ACS.
(a) Ibex hill	780
(b) Koramparai	1,472
(c) Between Chinnathalanar malai and Kavurkalmalai adjoining Mount Stuart estate on the south-east	672

(iii) Kukkal and Kudarayar blocks, in Udumalpet Range—vide D. Dis. No. 563/36, dated 3rd July 1936, of the Conservator of Forests, Coimbatore Circle.

The rest of the Coimbatore South division is open to grazing except that all fuel coupes in Pollachi and Udumalpet Ranges will be closed to general grazing for ten years from the year of felling. Also any area damaged by fire or other causes may be closed for a specified period, by special order in each case, with a view to its recovery, subject to approval by the Collector.

504. *Concessions.*—The Tunacadavu Range is closed to general grazing, except for cattle belonging to the subordinates and local labour and kept for their bona fide domestic purposes. The number will be restricted to one cow or buffaloe, on the average, for each subordinate or member of the local labour force and subject to a maximum of 120 head of cattle (out of which 40 are for the Palakadavu area) excluding calves up to one year old. Free permits will be issued for these. The permits are liable to be cancelled if the cattle are allowed to enter the plantations, or for any other reason, at the discretion of the District Forest Officer.

Compartment 1 of the old Punachi Working Circle is open to grazing, as a special case for cattle belonging to the residents at Attakatti on a grazing fee of Re. 1–4–0 per cow unit limited to a maximum of 30 head of cattle.

The Pulayars settled in Compartments 5 and 6 (*a*) of the old Punachi Working Circle for ponam regeneration of the new Punachi Felling Series of the Conversion Working Circle are permitted to graze up to a maximum of ten head of cattle, on free permits (goats being prohibited) within the felling series but not in regeneration areas. This concession may be increased to 20 head of cattle since the entire regeneration area of the year is now being treated under " ponam," and sometimes a part of the previous year's area as well.

SECTION 2.—METHOD OF TREATMENT—GENERAL.

505. *General grazing.*—In areas open to general grazing, any cattle (except goats) covered by proper permits will be permitted to graze subject to the usual conditions attached to the issue of such permits. A permit is valid for the Pollachi and Udumalpet ranges and for those parts of the Punachi range which are open to general grazing. The prevailing general permit rates are :—

	RS.	A.	P.	
Buffaloes	0	8	0	a head.
Cows, bulls, horses or asses	0	4	0	,,
Sheep	0	2	0	,,

506. *Penning.*—With a view to encourage penning, and thus reduce the incidence of grazing on the outer slopes, penning shall continue to be free but shall be covered by a licence. The practice of endorsing the licence with the names of the pens in which alone the cattle may be penned will be discontinued. Instead, a list of localities open to penning will be printed with the annual grazing notice and any of these may be occupied by the licensee at any time. A list of all pens, old or new, in areas open to general grazing is given below, with information about availability of watering facilities. The list has been prepared with the co-operation of local graziers and cattle owners and is more or less exhaustive. Pens not included therein may only be opened with the approval of the Conservator. Penning should not be allowed within any of the fuel felling series.

List of Cattle Pens in the Forests of Coimbatore (South) Forest Division.

Serial number.	Name of the cattle pen.	Name of the water source.	Whether perennial or semi-perennial.
	Pollachi Range.		
1	Thermalaipatti	Thermalai Ar	Perennial.
2	Pattithittupatti	Pattithittu Ar	Do.
3	Kanavametupatti	Chinnar	Do.
4	Sambalaipatti	Do.	Do.
5-A & B	Othakundupatti	Do.	Do.
6	Kulipatti	Do.	Do.
7	Mudupalipatti	Do.	Do.
8	Villonipatti	Villoni Ar	Do.
9	Jandakundupatti or Kokkumalai-patti.	Attakattipallam	Semi-Perennial.
10	Chinnammanaickenpatti	Chinnammanaickenpallam	Do.
11	Kambukadupatti	Kambukadupallam	Do.
12	Uppukulipatti	Uppukulipallam	Do.
13-A & B	Othamarathupatti	Kambakadupallam	Do.
14	Mudipatti	Do.	Do.
15-A & B	Thandiamaripatti or Pungoothu patti.	Pungoothu	Perennial.
16	Edavaloppatti	Boothakundupallam	Semi-perennial.
17	Kambankalipatti	Kambankalipallam	Do.
18	Vedikottaiparaipatti	Vedikottaiparaipallam	Do.
19	Manulpattti	Manulpattipallam	Do.
20-A & B	Manjakulipatti	Manjakuli Oothu	Perennial.
21	Sethupatti	Do.	Do.
22	Vengai (marathu) patti or Eachampatti.	Kunduruttipallam	Semi-perennial.
23	Bungalakundupatti	Garudamungalpallam	Do.
24	Thadaganachipatti or Toputhitthu-patti.	Thadaganachi Oothu	Perennial.
25	Porikundupatti	Porikundupallam	Semi-perennial.
26	Chillamarathupatti	Annaparaipallam	Do.
27	Thannicholaipatti	Thannicholaipallam	Do.
28-A & B	Karimetupatti	Mandi Malligai Kodikalpallam	Do.
29	Puliyampatti	Puliyampattikuthu	Perennial.
30	Avaraikodipatti	Erumakuthu	Semi-perennial.
31	Boyanapothupatti	Do.	Do.
32	Anaithalaipatti	Palamarathukuli	Do.
	Punachi Range.		
33	Buthakundupatti	Arugampattipallam	Semi-perennial.
34	Arugampatti	Do.	Do.
35	Gandropatti	Thorakadavu Ar	Perennial.
36	Mulipatti	Do.	Do.
37	Tanakalpatti	Tanakalpattipallam	Semi-perennial.
38	Kolluparaipatti	Uchalipothupallam	Do.
39	Thalakatupatti	Do.	Do.
40	Kalamparaipatti	Vettaikaranpallam	Do.
41	Surikulipatti	Uchalipothupallam	Do.
42	Uchalipothupatti	Do.	Do.
43	Oralukulipatti	Thorakadavu Ar	Perennial.
44	Kosaropatti	Do.	Do.
45	Kadamparaipatti	Kadamparai Ar	Do.
46	Vellimudipatti or Muppan solai patti	Do.	Do.
47-A	Thudupupalaipatti, West	Kadamparai Ar	Do.
47-B	Do. East	Thorakadavu Ar	Do.
48	Devi Ar solaipatti	Do.	Do.
	Udumalpet Range.		
49	Krumuttipatti	Thorakadavu Ar	Perennial.
50	Vandalpatti	Do.	Do.
51	Karimarathupatti	Do.	Do.
52	Pulialepatti	Do.	Do.
53	Jallimalaipatti	Do.	Do.
54	Molaiparupatti	Do.	Do.
55	Kolairalepatti	Do.	Do.
56	Nadumalaipatti	Stream to the north-east	Semi-perennial.
57	Poolankuthupatti or Govikundupatti.	Pulankuthupallam	Do.
58	Thimmunjipatti	Thimmunjipallam	Do.
59	Eattimarathupatti	Eattimarathupallam	Do.
60	Sanduvilavupatti	Kolathupallam	Perennial.
61	Mavadappatti	Do.	Do.
62	Pundi or Kulipatti	Nallar	Do.
63	Kanavaipatti	Vettaikaranpallam	Semi-perennial
64	Muchikuthupatti	Nallar	Perennial
65	Kallimarampatti	Kalliparaipallam	Semi-perennial
66	Gadithakattupatti	Nallar	Perennial
67	Varapatti or Soppukattupatti	Varapattikuli	Semi-perennial.
68	Parapatti or Parakolathupatti	Do.	Do.
69	Maravankattupatti or Pachanpothu-patti.	Pachanpothupallam	Do.
70	Alankulipatti	Alankulipallam	Do.
71	Mulai Modaku	Ponnalamman Ar	Do.
72	Balrimalai Foot or Mukuttipatti	Balrimalaipallam	Do.
73	Narakkalpatti	Nallar	Perennial.
74	Erivalavupatti	Erivalavupallam	Semi-perennial.
75	Kadukamarathupatti	Kadukamarathupallam	Perennial.
76	Vasambukulampatti	Vasambukulam	Do.
77	Kelavipatti	Kelavikulam	Do.

List of Cattle Pens in the Forests of Coimbatore (South) Forest Division—cont.

Serial number.	Name of the cattle pen.	Name of the water source.	Whether perennial or semi-perennial.
	Udumalpet Range—cont.		
78	Varapatti	Varapatti Oothu	Perennial.
79	Uppumannam	Uppumannampallam	Semi-perennial.
80	Melkurumalai	Kurumalaipallam	Perennial.
81	Kurumalai	Kurumalaipallam	Do.
82–A & B	Jallimuthanparaipatti	Kottai Ar	Do.
83	Periya selavatti	Selavatti Othu	Do.
84	Chinna selavatti	Selavatti pallam	Do.
85	Vandayam	Kottai Ar	Do.
86	Chinnapattimedu	Chinnapattipallam	Semi-perennial
87	Kallulipatti	Kallulipallam	Do.
88	Kulipatti	Kottai Ar	Do.
89	Kuttivayal	Pambumalaiapallam	Perennial.
90	Kottai Ar patti	Kottai Ar	Do
91	Attumalaipatti	Attumalaipallam	Do.
92	Poomalaipatti	Poomalaipallam	Do.
93–A	Mange Ar, East	Mange Ar	Do.
93–B	Mange Ar, West	Do.	Do.
94	Tenakadupatti	Chinnar	Do.
95	Nattukalpatti	Nattukalpallam	Semi-perennial.
96	Uppumalaipatti	Uppumalaipallam	Do.
97	Kodanthur	Chinnar	Perennial.
98	Parapatti	Parapattipallam	Do.
99	Molropatti	Murigud Ar	Semi-perennial.
100	Mulidikipatti	Do.	Do.
101	Bodinayakanpatti	Do.	Do.
102	Easalthittupatti	Easalthittupallam	Do.
103	Pochalapatti	Pochalapallam	Do.
104	Olainilapatti	Nandupallam	Do.
105	Kathadumparaipatti	Pambadumsolaipallam	Perennial.
106	Kottaithuraipatti	Chinnar	Do.
107	Sarakkupatti	Do.	Do.
108	Sapputhuraipatti	Do.	Do.
109	Kamanuthupatti	Kamanuthu	Do.
110	Oraikulipatti	Sangili Odai	Semi-perennial.
111	Thala Oothupatti	Thala Oothu	Perennial.
112	Sangili Odaipatti	Sangili Odai	Semi-perennial.
113	Yelumalayan Kovil	Temple wells	Do.
114	Kalthuparaipatti	Amaravathi	Perennial.
115	Pattinathu Velipatti	Do.	Do.
116–A	Duvanathupatti, West	Do.	Do.
116–B	Do. East	Do.	Do.
117	Karisamadai or Elluppathoraipatti	Do.	Do.
118	Puliyankannupatti	Do.	Do.
119	Thalinji	Ten Ar	Do.
120	Tekkamabalipatti	Kaluthakatti Odai	Semi-perennial.
121	Kumalam patti	Varavandi Odai	Do.
122–A & B	Midiparaipatti, East and West	Do.	Do.
123	Sandumalai patti or Eachanthittu-patti.	Eachanthittupallam	Do.
124	Vanjimalaipatti	Vanjimalai Odai	Do.
125	Alamarathupatti	Varavandi Odai	Do.
126	Erukalampatti	Do.	Do.
127	Pattikolathu manthai	Pattikolam	Do.
128	Arugampatti	Ten Ar	Perennial.
129	Mettupatti	Do.	Do.
130	Manjampatti	Do.	Do.

507. *Improvement to watering facilities.*—Such watering sources as are capable of improvement at a reasonable cost have been noted in the subjoined list. The work of improvement should only be taken up after the sanction of a properly prepared estimate. If the villagers are perpared to offer free labour for any such improvement, there should be no objection to its acceptance.

Name of pen.	Name of water source.	Nature of improvements considered necessary.	Estimated cost.
		Pollachi Range.	RS.
Thermalai patti ..	.. Thermalai Ar.	.. A bund to be constructed 15′ × 1½′ to a height of 5′ to make the water source shallow.	50
Avaraikodi patti ..	.. Erumakuthu	.. A dam 30′ in lngth, 1½′ in width, and to a height of 6′, is to be constructed.	60
		Udumalpet Range.	
Kamanuthu patti	.. Kamanuthu	.. A reservoir 20′ long, 4′ broad and 4′ high may be constructed in the bed of the spring.	150

508. *Inoculation of cattle.*—The department will not insist upon the inoculation of cattle prior to their admission into reserved forests, or bison areas, for grazing; but the provisions of G.O. Ms. No. 668, Development, dated 2nd April 1941, must be strictly observed.

509. *Closure of burnt areas.*—The District Forest Officer may close an area to grazing immediately after a fire if he considers that such closure is essential to its recovery from the damage caused by the fire, provided the extent so closed is not above 1,000 acres and subject to report, within ten days of the closure, to the Collector for his approval. Such closure should be adequately advertised in the adjoining villages and must be done immediately after the fire if it is to be effective.

510. *Control.*—See Chapter XI for the control form to be maintained.

SECTION 3.—ROTATIONAL GRAZING.

511. *Opening of fuel coupes closed to grazing.*—It was prescribed in paragraph 477 that fuel coupes will be closed to general grazing for a period of ten years commencing from the year of felling. The villagers concerned felt aggrieved at this long period of closure as it reduced the available grazing area considerably for non-penning cattle, the present incidence of grazing for such cattle being about one acre in Pollachi range and two acres in Udumalpet range, per cow unit. Fuel coupes closed to grazing after exploitation generally give rise to a valuable crop of fodder grasses which disappears ultimately when the canopy closes up. Such an invasion of valuable fodder grasses may be made available for special grazing provided the regeneration in the coupe, resulting from rab or ponam sowings, is safe from damage by grazing cattle. The opening of protected coupes to cattle affords an opportunity for the introduction of a rotational system of grazing therein, with its attendant advantages. It is therefore suggested that fuel coupes be opened to special grazing, on rotation, on the expiry of a minimum period of *three to five* years after the year of felling, provided the Conservator is satisfied in each case, that the Kumri regeneration therein is in no danger from cattle. The suggested system is on the lines recently introduced with considerable success in the Coimbatore North Division.

512. *Grazing blocks and paddocks.*—The aim of the system is the formation of a number of rotational blocks along the margins of reserves to accommodate " essential " cattle belonging to these villages which have cultivation near reserved forests. The " non-essential " cattle will pass on to more remote areas for general grazing. Each grazing block will consist of a number of " paddocks," which may increase annually from a minimum of two paddocks to a maximum of six. A " paddock " is the unit of rotational grazing in which cattle will be permitted to graze for a " period." When the number of paddocks in a " block " has increased to five or six, the formation of a fresh " block " is indicated. A convenient unit for a " paddock " is a fuel coupe. Paddocks will usually adjoin each other so that a " grazing block " may be a compact unit.

513. *Period.*—The " period " for which cattle may be permitted to graze continuously in one paddock will depend upon the number of paddocks in the grazing block and the quantity of grass available, among other factors. In blocks with two paddocks the usual period allowed in Coimbatore North is one month for each paddock, the cattle alternating between the two paddocks month by month. Where there are 3 or 4 paddocks, a paddock will be grazed for a minimum period of two weeks and may not be grazed for over one month, the grazier having discretion to move on to the next paddock within these limits. Where the block has more than 4 paddocks, the minimum period of grazing in one paddock is one week and the maximum is one month. Rotational grazing is thus secured by the cattle returning to a paddock after grazing in all the other paddocks in succession. These minima and maxima may be tried in the Coimbatore South Division, any required changes being made by the District Forest Officer as may be found desirable.

514. *Intensity of grazing or carrying capacity.*—The intensity of grazing or " carrying capacity " is calculated for the whole grazing block. It depends upon the quantity of edible grass available over the block and has therefore to be fixed for each block. It also depends on the fact whether the area has been grazed before or not (e.g.), a block under

rotational grazing can support a larger number of cattle per acre during the second year than during the first, partly due to a more profuse flush of grass consequent upon grazing down of the original flush. It is also conceivable that a fuel coupe might support a smaller number of cattle as it grows older as a result of closing up of the canopy. The intensity of grazing has therefore to be fixed by the District Forest Officer for each block and for each year with reference to the actual quantity and quality of the grazing available in it. In the Coimbatore North division, three acres are allowed per head, generally, during the first year and 2½ acres per head in the second year.

515. *Grazing fee.*—It is clearly justifiable to charge special fees for the privilege of grazing in special blocks. The usual practice is to charge a special grazing fee in addition to the normal one of four annas per cowunit. The cattle admitted to the special blocks will be covered by a special grazing permit in addition to the ordinary one. The rate of special fee to be charged will depend upon the available grazing in the block and the degree of demand for it and will be fixed by the District Forest Officer, with reference to these facts. In the Coimbatore North division, the special fee in one case was two annas per head in the first year but was raised to twelve annas per head for the next. A special grazing permit will have to be issued in the form that obtains in the Coimbatore North division. The prior sanction of Government will have to be obtained.

516. *Control.*—A record of movement of cattle in respect of each block will be maintained by the Range Officer. Graziers shall notify to the beat forest guard movement of cattle from paddock to paddock immediately it occurs. The standard rules governing control of cattle in rotational blocks and the control form to be maintained are given at the end of the chapter.

517. *General.*—The outline of the scheme of rotational grazing suggested for ultimate introduction in the fuel coupes of the division has been given above. It was not considered desirable to prepare a set scheme beforehand since a beginning in this new departure can only be successfully made by close contact with the concerned ryots and gentle persuasion. The ryots have to be convinced of the benefit of the scheme and they have then to actually experience it in practice in a place or two before it can be extended. The reactions of the ryots have to be studied in each case and suitable modifications made, bearing in mind that co-operation is the key to success and too much rigidity might prove to be a severe retarding factor. Progress may be slow at first and this is an advantage in that the department will then be in a position to modify the rules from time to time so as to contribute towards smooth and efficient working.

If the somewhat detailed scheme of rotational grazing suggested above cannot be introduced in the near future, right to graze a limited number of cattle in closed coupes for a limited period (say, 2 to 3 weeks) at special rates may be tried as a first step towards some system of rotational grazing. The District Forest Officer is not precluded from experimenting with other systems of rotational grazing outside the suggestions given above.

518. *Standard rules governing control of cattle in Special Rotational Grazing blocks.*—

Intensity of grazing or Carrying capacity	First year—3 acres per head. Second year—2·5 acres per head.

General rules.

(1) Cattle may graze only in one paddock *at a time* and in the block for which they hold their special permit.

(2) Removal of manure from special blocks is forbidden.

(3) Graziers are forbidden to carry knives or kenkis.

(4) Graziers shall notify immediately to the beat guard movement of cattle from paddock to paddock.

Periodicity of movement.

519. *Blocks with two paddocks.*—Cattle will alternate, grazing each paddock for one month and giving one month's rest.

520. *Blocks with three or four paddocks.*—Cattle will move from paddock to paddock after grazing for not less than two weeks but not more than one month in one paddock. A paddock will thus enjoy complete rest for a minimum period of one month after being vacated. Within these limits (two weeks and one month) the cattle may be moved from one paddock to another at the discretion of the grazier but subject to immediate report to the beat guard.

521. *Blocks with five or more paddocks.*—As for three or four paddocks, except that the minimum period during which cattle *must* graze in one paddock will be one week.

522. *Record of movement.*—A record of movement of cattle from paddock to paddock will be kept in the form given below, separately for each block. A copy of the record will be submitted to the District Forest Officer at the end of the grazing year or when a block is finally closed, whichever is earlier.

Record of movement of cattle in rotational blocks.

Range　　　Name of rotational blocks　　　Grazing season

Number of paddocks　　　Area　　　acres.　　　Number of cattle admitted

Paddock I.		Paddock II.		Paddock III.		Paddock IV.		Paddock V.		Paddock VI.	
Entered.	Vacated.	Entered.	Vacated.	Entered.	Vacated.	Entered.	Vacated.	Entered.	Vacated.	Entered.	Vacated

To be completed at the head office :

Total number of cowdays grazed.............

Total number of cowdays per acre..........　　　Signature of Range Officer.

CHAPTER IX.—WORKING PLAN FOR THE PROTECTION WORKING CIRCLE.

SECTION 1.—GENERAL.

523. *Constitution.*—Areas not included in the Conversion, Deciduous Selection, Evergreen Selection, Fuel or Bamboo Working Circles have been placed in the Protection Working Circle. The total area of the working circle is 140,020 acres or 218·8 square miles. They lie mainly in Punachi and Udumalpet ranges.

524. *Prescription.*—The areas allotted to the Protection Working Circle will not normally be exploited for timber except for dead or fallen trees of saleable species and the *Mesua* bearing areas dealt with in section 2 below. The grazing and penning of licensed cattle and the collection of minor forest produce are permissible. However, if an exceptionally high demand arises for any timber within the working circle, it may be exploited with the sanction of the Chief Conservator of Forests.

525. *Game preserve.*—An area of 43,000 acres on the grass hills round Akkamalai in Punachi range has been declared a "game preserve" in G.O. No. 833, Revenue, dated 15th April 1931. This area will be preserved from assignment for cultivation and the shooting of game therein will be regulated as necessary.

526. *White bison.*—An area of approximately 20,000 acres consisting mainly of the portions transferred from Madura district to Coimbatore South Forest Division and of parts in Coimbatore district, has been excluded from bamboo working largely on account of the fact that it contains white bison, which it is desirable to protect, as they are not known elsewhere. The intention is not that this area should be closed to all shooting, since this, as indicated above, is not considered a measure that, under existing conditions in India, is likely to preserve game. But in this area the shooting of white bison is prohibited by G.O. No. 2570-1/32-10, dated 10th April 1933.

527. *Shifting cultivation.*—Pulayars, Kaders and Muduvars who have lived in the forests from time immemorial continue to do so. Every year they need some land for raising cereals for their sustenance; and the demand is very uncertain depending very much on their whims. It has been the practice for the District Forest Officer to allow them to do shifting cultivation in well-defined areas as a concession from year to year, but this is clearly not a practice to be encouraged, and the efforts that are being made to put a stop to it must be continued. Chief Conservator's Proceedings Mis. No. 532, dated 28th November 1932, communicating copy of G.O. Ms. No. 1454, Development, dated 10th November 1932, permits the District Forest Officer to set aside limited areas for settled cultivation by such people, and in view of the advantages the system has in connexion with the settlement of labour colonies in various parts of the forests, the District Forest Officer should endeavour to replace shifting cultivation by the creation of such settlements, so far as he finds that they are desirable. Shifting cultivation in shola forests, by Muduvars, does more harm than that practised in diciduous areas and must therefore be strictly controlled.

SECTION 2.—SOME *mesua ferrea* BEARING AREAS.

528. *Enumeration.*—An enumeration of *Mesua ferrea* trees in certain evergreen forests was made by Mr. A. N. Sarma in 1934, outside the Kalar valley forests. The localities selected were mainly in Punachi range but partly in Tunacadavu, and are in the neighbourhood of tea plantations. They form part of areas set aside for cinchona plantations or intended for assignment to tea planters. The enumerations were conducted over five blocks with a total area of 3,496 acres. The results as prepared by Mr. Sarma are reproduced in the subjoined statement.

Statement showing the probable yield of sleepers in the Mesua ferrea bearing area of Iyerpadi, Villoni, Sheikalmudi and Savamalai Blocks of the Protection Working Circle of the South Coimbatore Working Plan.

Block and area.	Particulars.	Yield of Mesua ferrea from girth classes. 4′-5′	5′-6′	6′-7′	7′-8′	8′-9′	9′-10′	10′-11′	11′-12′	Above 12′.	Total number of B.G. sleepers.	Remarks.
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
1 Iyerpadi—398 acres.	Number of trees expected ..	1,777	873	405	243	168	48	24	12	3	..	331/8 per cent of the area was enumerated.
	Number of trees expected to be sound.	557	576	278	156	116	35	17	8	2	..	
	Gross volume of the logs in cubic feet.	18,267	24,768	16,402	12,168	11,484	4,148	2,278	1,164	308	..	
	Net outturn of sleepers in cubic feet.	8,856	12,441	7,839	5,568	4,941	1,707	918	468	126	..	
	Net outturn of sleepers in number.	2,952	4,147	2,613	1,856	1,647	569	306	156	42	14,288	
2 Savamalai—770 acres.	Number of trees expected ..	550	350	390	180	150	60	20	..	10	..	15 per cent of the area was enumerated.
	Number of trees expected to be sound.	260	231	266	116	103	43	15	..	6	..	
	Gross volume of the logs in cubic feet.	8,060	9,933	15,694	9,048	10,197	5,095	2,010	..	924	..	
	Net outturn of sleepers in cubic feet.	4,134	5,205	7,500	4,140	4,389	2,097	810	..	378	..	
	Net outturn of sleepers in number.	1,378	1,735	2,500	1,380	1,463	699	270	..	126	9,551	
3 Sheikalmudi—288 acres.	Number of trees expected ..	234	248	114	76	58	41	23	23	..	..	15 per cent of the area was enumerated.
	Number of trees expected to be sound.	111	164	78	49	40	30	17	15	..	..	
	Gross volume of the logs in cubic feet.	3,441	7,052	4,602	3,822	3,960	3,555	2,278	2,183	..	..	
	Net outturn of sleepers in cubic feet.	1,764	3,543	2,199	1,749	1,704	1,464	918	879	..	..	
	Net outtern of sleepers in number.	588	1,181	733	583	568	488	306	293	..	4,740	
4 Villoni—690 acres.	Number of trees expected ..	1,105	713	480	211	129	29	6	6	..	..	10 per cent of the area was enumerated.
	Number of trees expected to be sound.	523	471	327	136	89	21	4	4	..	..	
	Gross volume of the logs in cubic feet.	16,213	20,253	19,293	10,608	8,811	2,489	536	582	..	..	
	Net outturn of sleepers in cubic feet.	8,316	10,173	9,222	4,854	3,792	1,023	216	234	..	..	
	Net outturn of sleepers in number.	2,772	3,391	3,074	1,618	1,264	341	72	78	..	12,610	
Block which falls within Mr. Laurie's Working Plan—1,350 acres.	Number of trees expected ..	1,819	1,446	1,187	718	498	191	77	57	..	..	
	Number of trees expected to be sound.	861	954	809	461	343	138	56	37	..	..	
	Gross volume of logs in cubic feet.	26,691	41,022	47,731	36,036	33,951	16,353	7,504	5,384	..	..	
	Net outturn of sleepers in cubic feet.	28,923	20,607	22,815	16,494	14,613	6,699	3,024	2,166	..	..	
	Net outturn of sleepers in number.	9,641	6,869	7,605	5,498	4,871	2,233	1,008	722	..	38,447	

529. *Treatment.*—The exploitation of the Kalar Felling Series will be completed by 1945, and there is not likely to be any further exploitation in the series during the period of this plan. The question of extending exploitation to the more remote areas of the Kalar valley not now included in the Kalar Felling Series, is yet undecided. If conditions are not favourable for such exploitation by 1945, and if the five blocks mentioned above can be exploited profitably under the conditions prevailing then, it is suggested that their exploitation may be taken up from 1946 in continuation of the Kalar Felling Series. The method of exploitation will depend upon the future of these blocks; if they are definitely to be taken up for tea or cinchona planting, all *Mesua ferrea* trees that can profitably be converted into sleepers will be removed, irrespective of girth; but if no such decision has been arrived at by then, they will be exploited under prescriptions similar to those for the Kalar Felling Series, so as to maintain the character of the vegetation on them.

SECTION 3.—THE KALAR VALLEY SHOLAS.

530. *Area outside Kalar Felling Series.*—The Kalar valley sholas to the south of coupe VIII of the Kalar Felling Series and lying outside that series were investigated with a view to their exploitability. The area available for exploitation lies to the south of the Kalar and between it and the Italiar and comprises four valleys—the Paraliar valley, the Vayalar valley (a name given by the writer), the Iruttaliar valley and the Italiar valley. The south-western corner consisting of precipitous cliffs and the south-eastern corner of rocky ridges and peaks rising to over 6,000 feet, are both unworkable. The balance available for exploitation is about 4,900 acres, an area almost equal to that included by Mr. A. N. Sarma in his Evergreen Selection Working Circle.

531. *Description of vegetation.*—The most striking feature of the area is the occurrence therein of extensive gregarious patches of almost pure *poeciloneuron indicum*, from coupe VIII to the junction of the Italiar with the Anamudiar. On the ridges and higher slopes, however, *Mesua ferrea* displaces *Poeciloneuron*. But beyond the junction of the two streams, the *Poeciloneuron* is confined to a comparatively narrow belt along the Italiar, the slopes supporting *Mesua ferrea*. A rough stockmapping shows that the areas covered by each of the two types of vegetation (*Mesua* and *Poeciloneuron*) are about equal.

532. *Rough estimate of stock.*—The total number of *Mesua* trees over 7 feet girth at breast height over the whole of this area was estimated to be about 10,000. About 90,000 broad gauge sleeper units may be expected from the conversion of these 10,000 trees on the basis of past experience from fellings.

533. *Extraction systems considered.*—It is estimated that about 12 miles of road will be required on the south of the Kalar river to enable exploitation of the area under consideration. The proposed road through coupes IX and X of the Kalar felling series, on the north of the Kalar river, will require to be metalled so as to maintain communication in all seasons. And the Kalar has to be crossed by a pakka bridge. The 12 miles of metalled road is estimated to cost Rs. 60,000 at Rs. 5,000 a mile, the metalling of 2½ miles of road on the north of the Kalar river can be done for Rs. 7,000 and a bridge across the river is likely to cost not less than Rs. 20,000. Including maintenance costs for ten years, a good extraction system as outlined above may be expected to cost about a lakh of rupees. The charge on a broad gauge sleeper on account of roads may therefore be expected to be over a rupee per unit.

The substitution of an earth road for the metalled road of 12 miles will reduce the capital expenditure on this section to about Rs. 25,000 taking Rs. 2,000 as the cost of making one mile of an earth road in this locality. The pakka bridge may be replaced by a foot suspension bridge for men and a wire ropeway for hauling sleepers across, as exist at present, at a cost of about Rs. 2,000. The metalling of the 2½ miles of road on the north of the Kalar river cannot be dispensed with and will cost Rs. 7,000. The total cost of this cheaper road system will thus be about Rs. 34,000. But the absence of a through road will involve a separate carting arrangement for the other side of the Kalar with grazing difficulties the bulls will have to face in shola forests. A solution may perhaps be found in a speedy steam caterpillar tractor burning wood, with a caterpillar trailer to load the sleepers in, a combination which can work on an earth road in all seasons. The cost of such a tractor combination has to be ascertained.

534. *Probable production cost.*—The present cost of production of a broad gauge sleeper from the Kalar Felling Series is about Rs. 5 inclusive of overheads. The formation and maintenance of a pakka road system at a cost of about a lakh of rupees will add about a rupee for broad gauge unit produced, raising production costs to about Rs. 6. With an earth-road system as outlined above, the charge of one rupee per broad gauge unit may be reduced to about one half of this. The supply of transmission poles from the Kalar valley forests will not help to spread out costs, since production costs for *Poeciloneuron*

poles from coupe IX and X have been found to be higher than their sale value—the department got Rs. 16 for a 35-feet pole delivered at Coimbatore while the cost of production and delivery exceeded Rs. 19.

535. *Conclusion.*—It will therefore be seen that the exploitation of the remoter sholas of the Kalar valley is not likely to be profitable on the present sale prices for broad gauge sleepers. If it is decided to expand the cultivation of cinchona to these remote areas, they may then be exploited more fully without any silvicultural restrictions. The outturn will then be higher so that production costs will go down proportionately. In these circumstances it might be possible to induce the cinchona department to share part of the cost of the road system and so help to bring down the cost of production still further. The question of exploiting the Kalar valley sholas not included in Mr. Sarma's Evergreen Working Circle may therefore be examined in 1945 after a decision has been made on the expansion of cinchona planting in the locality. If, however, sleeper prices rise in the meantime to about Rs. 7 per broad gauge unit their exploitation may be expected to be as profitable as the nearer areas of the Kalar valley are now, and the scheme will be worth closer investigation.

CHAPTER X.—ESTABLISHMENT AND LABOUR.

536. *Establishment.*—The existing executive establishment is considered sufficient.

537. *Labour.*—The existing kadir labour force has been able to deal with 100 acres of ponam regeneration successfully in 1940. It will be necessary to augment this force so as to tackle the annual regeneration area of 200 acres. In adding to this existing number of kadirs the question of providing work for them for the rest of the year after they have completed ponam regeneration has to be considered. The departmental collection of minor produce prescribed elsewhere, will relieve part of this problem. Departmental ponam for feeding elephants will be another piece of work in which the kadirs can earn wages from the department. The expansion of fire protection operations provided in the plan will also help in this direction.

CHAPTER XI.—MISCELLANEOUS PRESCRIPTIONS AND REGULATIONS.

SECTION 1.—MAINTENANCE OF BOUNDARIES.

538. *State boundaries and district boundaries.*—All State and district boundaries will be maintained in accordance with the orders of Government in force. State boundaries will be checked as required by the rules.

539. *Reserve boundaries.*—Exterior reserve boundaries will be maintained correctly, so as to conform with the settlement notifications.

SECTION 2.—FIRE PROTECTION.

Tunacadavu range.

540. *General.*—The measures for fire protection prescribed by Mr. Laurie were curtailed considerably on the abolition of gap regeneration and after the extensive fires of 1935 which followed the general drying up of bamboos over the whole of the range. The method of general protection followed since 1935 has been found satisfactory and will be continued but (1) the fire line along the Vengolimalai ridge will be revived since it helps to confine a general fire to the Tunacadavu or the Ulandi valley, and (2) the fire line from Umayamalai running southwards along the Panati-ar on its eastern bank will be abondoned as the forest to its east is mainly evergreen. The general fire protection measures for Tunacadavu range will be the burning of broad fire lines mainly along outer boundaries between guide lines as specified below. The guide lines will be roads, rivers, reserve lines or lines specially cut to a width of 8 or 12 feet. The guide lines will be completed by the middle of December and the burning done as early as possible after this, in January or early February. Fire must not be permitted to escape from between the guide lines. Fire patrols will be employed during the dry season as necessary.

The following lines will be maintained as described above :—

(*a*) From Tellikal to Tekkadi, 8·78 miles. A guide line will be cut about a hundred yards from the river, sometimes coinciding with the road, and the width between it and the river will be burnt.

(*b*) From Tekkadi to Ayyaswamimudi, 1·12 miles. The existing road will be used as a guide line. Another guide line about a 100 yards to the south of it will be cut and the intervening width burnt.

(*c*) From Pandaravarai along the Pollachi Tunacadavu range boundary to where it hits the ghat road near 14th mile 7th furlong, 2·08 miles. Two guide lines 12 feet wide will be cut, one on the range boundary and the other about 100 yards from it.

(*d*) From the 14th mile 7th furlong on the road to the sheet rock below Kolambumalai, 1;5 miles. Two guide lines will be cut 12 feet wide and 100 yards apart.

(*e*) From Umayamalai to Vengolimalai, 3·84 miles. Two 8-foot guide lines, 100 yards apart will be cut as far as Vengolimalai.

(*f*) From Vengolaimalai to Pulalimudi along Cochin boundary, 4·50 miles. The Cochin boundary will form one guide line and the other guide line 8 feet wide will be on the northside of the ridge and about 200 yards from it.

(*g*) From Pulalimudi to the junction of the Tunacadavu and Itti streams at Tellikal, 0·86 miles, along the Cochin boundary. The Cochin boundary will be one guide line and the other will be a hundred yards away from and parallel to it and 8 feet wide.

(*h*) From Vengolimalai to Chinnar, along the Cochin boundary, 3 miles. Two guide lines 100 yards apart will be required between Chinnar and the Cochin frontier (half a mile). For the remaining 2½ miles one guide line will suffice, 100 yards away from the Cochin boundary.

(*i*) From Periyar to Naikundru, 1¼ mile. One guide line 100 yards away from the Cochin boundary.

541. *Cost of general protection.*—The cost of general protection, including the pay of fire patrols, protection of timber depots, buildings and the permanent preservation plot at Tellikal, is estimated at Rs. 1,150 per year for this range.

542. *Plantations.*—The special protection of teak plantations by means of external and interior lines has been dealt with in Chapter II of Part II. The average annual cost for special protection has been estimated at Rs. 1,096 for the next 15 years.

Punachi range.

543. *General protection.*—The external boundary of the Punachi block consisting of compartments 1 to 20 (including the newly formed 20-a) will continue to be cut and burnt to a width of 50 feet, the total length being 9 miles. Inter-compartment lines will be cut and burnt to a width of 15 feet, as at present, over a total length of 7 miles. The ghat road will be fire traced for a length of 1¼ mile from the 11th mile 3rd furlong to the waterfall estate. Cart-stands will be fire traced as necessary. Early burning will be done on the grass hills, as as present, so as to protect the sholas. The total cost for general fire protection in the range will be about Rs. 300.

544. *Plantations.*—The fire protection of plantations has been dealt with in Chapter II of Part II. Since the compartment boundaries are fire traced under general protection, the length of boundaries of plantations to be fire traced will often coincide with them or be close to them. The average annual length of external boundaries to be fire traced during the next 15 years is estimated at 1 mile and the internal boundaries at a mile and a half. The average annual expenditure on this account will be Rs. 38.

SECTION 3.—BUILDINGS AND WELLS.

545. *Foresters' quarters at Topslip.*—The accommodation at Topslip is inadequate for the staff stationed there. Quarters for four foresters is the minimum addition required. They may be built in two blocks (of two quarters in each) *as soon as* funds permit. Estimates have already been prepared in the District Forest office : each block has been estimated to cost Rs. 1,500.

546. *Anaigundi rest shed.*—The thatched temporary inspection shed at Anaigundi may be replaced by a permanent resthouse. It will have to be decided if it will be more economical to dismantle one of the buildings at Palakadavu and use the material for this purpose than to erect an entirely new one. An amount of Rs. 1,500 is provided. The work may be taken up after the economic strain of the war has eased.

547. *Bore wells.*—The bore well at Sungam has been a success. Another bore well at Anaipadi will be required in order to relieve the scarcity for water there during summer. The work should be taken up in 1941. Estimated cost Rs. 350.

548. *Udumalpet.*—The range clerk's quarters in the depot site at Udumalpet require some improvements so as to afford some privacy to the occupants and to make them more comfortable to live in. A compound wall or live fence, a latrine and ceiling tiles for the two living rooms will be required. Total estimated cost is Rs. 100.

SECTION 4.—ROADS, PATHS AND BRIDGES.

549. *Maintenance of roads.*—All roads must be maintained in good order to the extent necessary. Roads not in use should receive attention at least in regard to drainage to prevent cutting up.

CHAPTER XI - Miscellaneous Prescriptions and Regulations
Section 2 - Fire Protection - Tunacadavu Range.

Para 540 - General - (g) - For the existing Para 540 (g) substitute the following.

"Para 540 (g): From Pulalimudi to the junction of the Tunacadavu and Itti ar rivers, at Tellikal, 0.86 miles, along th Cochin boundary, the Cochin boundary will be cut to a width of 20 feet and burnt." (C.C.P.Mis.No.153/50 dated 8.4.50)

New construction—Tunacadavu Range.

550. *Mr. Laurie's road system.*—A complete system of roads for Tunacadavu range, involving a total length of 46 miles, was drawn up by Mr. Laurie. Fifteen miles of this were already in existence, 25 miles were to be completed within ten years, and the balance was to be completed before the end of the first felling cycle. The programme set out for ten years will be more or less completed by that time. New roads will be required to be made in accordance with the programme laid down below, so that the coupes may be exploited in the prescribed order :—

Year.	Roads to be made.	Length in miles.	Remarks.
1941–42	Continue the Sichali road along the Tunacadavu river towards Tellikal.	1	
1942–43	Do. do. ..	1	Estimated cost Rs. 1,500 a mile.
1943–44	Continue Top Tekkadi road along Tekkadi river towards Padiparai.	1	
1944–45	Continue Sichalli road to Tellikal	1	
”	Construct Sichali-Anaigundi road	1½	Estimated cost Rs. 4,000 a mile.
”	Continue Top Tekkadi road towards Tellikal ..	1	
1945–46	Continue the Sichali road until it meets Sungam-Tellikal road.	1	
1946–47	Continue Top Tekkadi road towards Tellikal ..	1	Estimated cost Rs. 1,500 a mile.
1947–48	Continue Tellikal-Padiparai road towards Padiparai.	1	
1948–49	Do do. ..	2	

New construction—Punachi range.

551. *Road system in Kalar valley.*—An economic extraction system for bringing out the produce from coupes VIII to X of the Kalar Felling Series will be as follows :—

From Valparai along the Sholayar main road for about 4½ miles to the Kalyar estate coffee shop; from there for about 2 furlongs, along a grass covered road of the Kalyar estate till it meets a Thaimudi estate road; and from there along the Thaimudi estate road for about 1 mile and 6 furlongs. This road stops within about 1½ furlongs of the northern boundary of coupe X of the felling series. The Forest department will have to continue this road to the northern boundary of coupe X and thence continue it inside coupes X and IX, at a ruling gradient of 1 in 15, down to the Kalar, to the south-eastern corner of coupe IX. The cost of this new construction and its maintenance for the period for which the road will be useful and the other charges which the department will have to meet for using the private roads mentioned above during the same period, will come to about Rs. 16,850. A copy of a detailed report on the proposed extraction system and the terms under which the owners of the private roads have permitted the Forest department to use their roads has been supplied to the District Forest Officer. In 1941–42 only that portion of the road falling inside coupe X will be constructed and in the next year the road will be continued inside coupe IX to its south-eastern corner.

552. *General.*—No other permanent roads will be required during the period of the plan. Temporary extraction roads running from main roads into coupes under felling will be required in a few cases, the cost being charged to exploitation.

SECTION 5.—SUPPLY OF AGRICULTURAL IMPLEMENTS.

553. *Criticism of present system.*—It has been the practice for the past ten years or so to supply agricultural implements to ryots from the area on the Pundi plateau set apart for shifting cultivation by Pulayars. The annual demand of about 600 implements was being met by the issue of headload tickets at an anna each to the ryots or their servants, the felling of the tree, the fashioning of the implement and its removal being effected by the holder of the ticket. An extent of 5 to 25 acres was demarcated for the purpose inside the area set apart for Pulayar shifting cultivation, and the privilege was allowed once or twice a year for three successive days at a time. With the exception of teak, rosewood and *Pterocarpus marsupium*, the licensee could fell and convert any tree he found suitable for the purpose, inside the demarcated area. The concession is being utilized year after year and ryots come from 10–12 miles away for the purpose, which shows that the demand is real and that there are no other legitimate means of obtaining the supply at reasonable prices.

But the effect of this exploitation on the forest has been that practically every tree above a breast height girth of 2 feet has been felled from the areas demarcated; and the Pulayars have not cultivated the areas, on the plea of their easy accessibility to wild elephants. The wastage involved in conversion has been high, all the branchwood and part of the stem being left in the forest. The maximum return is about 8 annas for the largest trees.

The wastage and the denudation could be justified if the exploitation could be followed up by regeneration but the Pulayars lack the initiative and the resource to keep out elephants from their cultivation, so that ponam regeneration is out of the question, at least until some effective means of keeping out elephants can be devised. It is therefore proposed to discontinue the present system and replace it by a similar system of supply from fuel coupes.

554. *Agricultural implements from fuel coupes.*—The only fuel series in Udumalpet range which support growth fit for conversion into agricultural implements are Chinnar, Kamanuthu, Navalodai and Amaravathi. Though there is a provision in the agreements with fuel coupe contractors that they should supply agricultural implements at the coupes to bona fide ryots at special reduced rates, such implements are rarely so supplied in practice and the condition is difficult to enforce. It is therefore proposed to allow part or whole of a coupe in one or more of the series mentioned above to be exploited for agricultural implements by holders of headload tickets, in the year prior to that in which they are due for clearfelling as fuel coupes. The District Forest Officer will decide every year the number of coupes and the area in each of them from which trees may be felled and agricultural implements fashioned and removed by permit-holders. The decision will be based on demand and the standing growth in the coupe. Coupes or parts of coupes due for clearfelling for fuel in any one year will be exploited for agricultural implements in the previous year. The rate per implement is at present 1 anna in the Pundi coupes, but for the more accessible areas now proposed a higher rate is justifiable. The actual rates will be fixed by the Conservator, in consultation with the District Forest Officer, with reference to accessibility, demand, and market rates. The permit-holders shall not fell teak, rosewood or vengai but may fell any other species suitable for agricultural implements. They will not be permitted to remove any material other than such implements and shall leave behind all waste resulting from conversion and all non-utilizable topends. The privilege will be allowed twice a year, for three successive days at a time, on dates convenient for the ryots. It is probable that when a coupe from which such implements have been removed is put up for sale in the next year, intending purchasers will offer a disproportionately low price for it on the plea that the removal of agricultural implements has taken away " the plums from the cake." It is difficult to assess beforehand to what extent the prices are likely to suffer, in consequence. The contractor will gain by being saved a good deal of fellings. The system should therefore be tried for a minimum period of three years even if some loss be incurred. At the end of this priod a full report should be submitted by the District Forest Officer to the Conservator who will then decide about its continuance or otherwise.

SECTION 6.—SANDAL PROPAGATION.

555. *Formation of propagation centres.*—Attempts were made to introduce sandal in the Udamalpet range by the formation of propagation centres, as prescribed by Mr. Sarma, during the last five years. They were on the whole unsuccessful, mainly because of successive failures of the monsoons, but partly on account of difficulty of supervision on the comparatively inaccessible Pundi plateau. The formation of propagation centres on the Pundi plateau will therefore be discontinued but they will continue to be made as before in the Thalinji-Manjampatti valley.

Five propagation centres will be formed in each of the beats in this valley every year. Suitable sites will be selected by the Range Officer and approved by the District Forest Officer. Ripe sandal seeds will be collected in March–May and the pulp removed before sowing. The sowing will be done in May-June, with the onset of the south-west monsoon. Where proper hosts are not present the sandal should be introduced along with dhall (*Cajanus indicus*). More detailed instructions about the formation of propagation centres will be found in a pamphlet on sandal regeneration compiled in 1932 by Messrs. C. C. Wilson and J. E. M. Mitchell.

556. *Sandal and shifting cultivation.*—On the Pundi-Mavadap plateau, sandal may best be introduced along with field crops in areas set apart for shifting cultivation by Pulayars. The area proposed for cereal cultivation in any one year will be staked at 30 feet by 30 feet as soon as soil preparation has been completed by the Pulayars and sandal dibbled at each stake (about 10 seeds to a stake) at the same time that the cereal seeds are sown by them. The Pulayars should keep the seedlings weeded at their cost. At the end of two

years the survivals may be enumerated and the Pulayars rewarded for established seedlings at the rate of one anna for a minimum of one established seedling at each stake. For full stocking the reward will amount to Rs. 3 per acre.

SECTION 7.—LIVESTOCK.

557. *Elephants.*—There are now 29 elephants in the division, including those under training. No increase is considered necessary.

558. *Elephant capturing.*—Elephant capturing operations will be continued on the same lines as at present.

SECTION 8.—STORES, TOOLS AND PLANT.

559. *Stores and tools.*—A provision of Rs. 10,000 is made for the purchase of stores and tools for the period 1941 to 1955 at about Rs. 700 a year.

SECTION 9.—ARTIFICIAL REGENERATION ROUND THE TIRUMURTHI TEMPLE.

560. *Poverty of growth.*—An area of 1,280 acres has been allotted round the Tirumurthi temple in Udumalpet range for the removal of dead fuel on head-load tickets for supply to pilgrims. The area consists mainly of open hill slopes of poor stony soil, covered by stunted growth of *Albizzia amara*, *Proteum caudatum*, *Givotia*, *Euphorbia* and other softwooded species. An average annual revenue of Rs. 60 representing the removal of about a thousand head-loads of fuel, is being realized from this area by the sale of permits.

561. *Artificial regeneration.*—If the removal referred to above is continued for a decade or two there is not likely to be much growth left on the area. It is suggested, therefore, that artificial regeneration may be undertaken here with a view to prevent complete denudation and augment the supply. *Rab* regeneration in patches 20 feet by 20 feet in extent appears to be suitable. The patches may be prepared by cutting down softwood species in pockets of good soil, burning them and fencing them with thorns. *Acacia planifrons* and *Melia indica* are species suited to the locality. About Rs. 10 a year may be spent profitably in this manner. The area is visited frequently by the surrounding villagers so that its successful regeneration will also serve as a demonstration area of what can be accomplished on sparsely clad hillslopes.

SECTION 10.—CARDAMOMS.

562. *Leases for cardamom cultivation.*—The evergreen forests in the upper parts of the Palakadavu valley (now in Punachi range) are inaccessible for the exploitation of timber but are suitable for growing cardamom. Cardamom growers in the Anamalais are at present much exercised by the prevalence of disease, but should this menace, abate, or be brought under satisfactory control, it would be desirable to encourage the cultivation of cardamom in these forests by offering reasonable terms to lessees who are prepared to take up for the purpose individual blocks not below a hundred acres in extent, which is understood to be the minimum economic size for a regular cardamom plantation. Smaller blocks may bring in petty cultivators who are likely to be undesirable in the neighbourhood of the regular plantations of the Anamalais. Private individuals now own cardamom plantations in the Cochin State almost touching the Anamalai plantations in the Coimbatore district and the Anamalai Planters' Association has granted permission to such individuals to transport their cardamoms over the Associations' roads, which shows that the association is not likely to consider its interests jeopardized by every neighbouring private planter. Moreover, the areas proposed do not adjoin any of the Anamalai estate. Considering the restrictions imposed by Government on the expansion of tea planting and the obvious evil effects of clearing sholas for this purpose, these forests are not likely to be leased for tea planting in future. It will therefore be legitimate on the part of Government to lease them out for the cultivation of cardamoms with a view to the realization of revenue therefrom without endangering the factors of the locality. If the suggestion is acceptable, leases may be offered on the lines that obtain in the Madura division. Somewhat easier terms may have to be fixed to start with so as to popularize the scheme.

SECTION 11.—" WOOD'S GRAVE."

563. *Formation of permanent grave.*—" An area 4 chains long and 3 chains wide symmetrically disposed round the grave of the late Hugo Wood in the 1916 plantation below Mount Stuart bungalow will be preserved and will never be clearfelled. The length of the area will run east and west and it will be demarcated at the four corners by substantial cairns. The teak crop within the area will be thinned so as to favour the best trees and will be tended from time to time as may be found necessary in such a way that the final

crop of teak trees originally planted by the late Hugo Wood will form a grave that will be allowed to grow in perpetuity as a living memorial to him." (C.C.P. No. 498, Press, dated 11th November 1932.) The grave and its surroundings will be kept in good order.

SECTION 12.—ANTI-MALARIAL MEASURES.

564. *Malarial prophylaxis.*—The anti-malarial measures now being followed consist of the clearing of shrubs and low vegetation round residential buildings, and on stream margins, the treatment of streams and stagnant pools with a mixture of kerosene, heavy oil and Pyrocide 20, and the spraying of residential buildings with a mixture of Pyrocide 20. These operations are carried out from about the 15th of December to the middle of June. Most of the staff of Tunacadavu range is concentrated at Topslip, and the subordinates are being taken out in a motor bus every day to Anaipadi in the morning and back to Topslip in the evening, at Government expense. These measures have been found to be very effective. They will be continued and any modern improvements in the technique of malaria control introduced as may be found desirable.

565. *Treatment.*—The department maintains a compounder at Topslip to carry out the measures described above and for the administration of quinine and other medicines to the staff and the labour force. It has been decided to replace the compounder by a forester who has undergone the Sanitary Inspector's course at Madras and two foresters are at present undergoing the course with this object. A telephone connexion is being maintained with the dispensary at Vettakkaranpudur so that the doctor can be called in expeditiously in cases of urgency.

566. *Cost.*—The average annual cost of anti-malaria measures is estimated at Rs. 1,000.

SECTION 13.—CONTROL.

567. *Control forms.*—The "control book" of the usual type will be replaced by a set of "Control Forms," with respective prescriptions written up for fifteen years for all the working circles. All forms will be in foolscap size in loose leaf files and duplicate sets will be issued to the District Forest Officer with the working plan. Each major operation in a working circle has been given a simple but separate form, as also each important cultural operation. The "Record of Works" deals only with minor prescriptions or routine matters such as fire protection, road repairs, etc., which have also been written up for fifteen years.

568. *Deviation statement.*—A "deviation statement" in the form given in Appendix C will be submitted with the control returns by the District Forest Officer to the territorial Conservator who will submit it to the Chief Conservator, with his remarks, for sanction. The sanction order will be quoted in the "Remarks" column, on receipt. Minor deviations may be sanctioned by the Conservator on the "deviation statement" without reference to the Chief Conservator.

569. *Control Journal.*—A Control Journal will be maintained for the whole division. A list of headings is given in Appendix C. No entries need be made if there is nothing of real interest to record. The final heading in the Journal is a statement comparing the financial forecast of the working plan with the actuals.

570. *List of control forms.*—A list of the control forms prescribed is given below—each felling series will have a separate form :—

(1) Control of final fellings in the Conversion Working Circle.
(2) Record of yield from final fellings in the Conversion Working Circle.
(3) Control of subsidiary fellings in the Conversion Working Circle.
(4) Record of yield from subsidiary fellings in the Conversion Working Circle.
(5) Control of regeneration operations in the Conversion Working Circle.
(6) Control of thinnings in the Conversion Working Circle.
(7) Record of yield from thinnings in the Conversion Working Circle.
(8) Control of fellings in the Deciduous Selection Working Circle.
(9) Record of yield from fellings in the Deciduous Selection Working Circle.
(10) Control of fellings in the Evergreen Selection Working Circle.
(11) Record of yield from fellings in the Evergreen Selection Working Circle.
(12) Control of fellings in the Fuel Working Circle.
(13) Record of yield from the Fuel Working Circle.
(14) Control of fellings in the Bamboo Working Circle.
(15) Record of yield from the Bamboo Working Circle.
(16) Control of operations in the Minor Forest Produce Working Circle
(17) Record of yield from the Minor Forest Produce Working Circle.
(18) Control of grazing in the Grazing Working Circle.
(19) Record of works.
(20) Control Journal.

Other Records.

571. *Nursery ledger.*—A *nursery ledger* will be maintained for every nursery on the lines at present in vogue.

572. *Regeneration ledger.*—A *regeneration ledger* will be maintained as at present for every area under concentrated regeneration in the Conversion Working Circle.

573. *Plantation history.*—The *plantation history* will continue to be maintained as at present. A stockmap showing the distrbution of quality classes in each plantation should be attached to its history. Maps for plantations over five years old in 1940 have been supplied by the working plans branch, copies of which may be made and attached to the histories. The younger plantations should be stock-mapped on the same lines when they attain the age of six or seven years.

574. *Fire maps.*—Fire maps will be maintained on tracing cloth copies to a scale of 2 inches = 1 mile.

CHAPTER XII.—FINANCIAL FORECAST AND COST OF THE WORKING PLAN.

SECTION 1.—FINANCIAL FORECAST.

575. *Abstract of financial forecast.*—Statements exhibiting details of the estimated revenue and expenditure for the fifteen year period 1941–42 to 1955–56 are appended. An abstract is given below :—

Serial number and working circle.	Revenue.			Expenditure		
	RS.	A.	P.	RS.	A.	P.
(1) Conversation Working Circle	19,49,059	12	0	6,24,829	10	0
(2) Deciduous Selection Working Circle	2,50,499	0	0	62,719	4	0
(3) Evergreen Selection Working Circle	6,39,700	0	0	3,33,490	0	0
(4) Fuel Working Circle	1,56,410	0	0	12,850	0	0
(5) Bamboo Working Circle	85,845	0	0	....		
(6) Minor Forest Produce Working Circle	1,02,750	0	0	12,750	0	0
(7) Grazing Working Circle	69,000	0	0	....		
(8) Miscellaneous	1,10,100	0	0	5,91,560	0	0
(9) Establishment	....			12,12,900	0	0
Total ..	33,63,363	12	0	28,51,098	14	0

Anticipated total surplus Rs. 5,12,264–14–0.

Anticipated annual surplus Rs. 34,150–15–10 or Rs. 34,151.

The gross revenue is Rs. 0–14–0·9 per acre and the expenditure is Rs. 0–11–11·2 per acre. The surplus is therefore Re. 0–2–1·7. The expenditure is 84·77 per cent of the gross revenue.

Financial forecast for fifteen years from 1941–42 to 1955–56.

576. *Revenue*—

Serial number and source.	Amount.		
	RS.	A.	P.
(1) *Conversion Working Circle.*—By sale of timber from clear felling and subsidiary felling coupes in Mount Stuart Series, prescribed for felling for fifteen years from 1941–42 onwards at the sale depot at Pollachi :—			
Teak—698,749 c.ft. at Rs. 1–12–0 per c.ft.	12,22,810	12	0
Rosewood—20,533 c.ft. at Rs. 2–0–0 per c.ft.	41,066	0	0
Other saleable species—497,843 c.ft. at Re. 1 per c.ft.	4,97,843	0	0
By sale of 6,000 block sets of spokes and felloes at Rs. 12 a set.	72,000	0	0
By sale of 1,500 single sets of spokes and felloes at Rs. 16 a set	24,000	0	0
By sale of 15 clear felling coupes of 396 acres in Punachi Series to contractors at Rs. 25 per acre	9,900	0	0
By sale of poles obtained from thinnings—			
13 year old plantations—2,875 acres at Rs. 8 per acre ..	23,000	0	0
22 year old plantations—1,815 acres at Rs. 30 per acre ..	54,450	0	0
34 year old plantations— 57 acres at Rs. 70 per acre ..	3,990	0	0
Total ..	19,49,059	12	0

Serial number and source.	Amount.		
	RS.	A.	P.
(2) *Deciduous Selection Working Circle.*—By sale of timber obtained from 15 selection felling coupes prescribed for felling from 1941–42 onwards—			
Tunacadavu Series—			
Teak 88,148 c.ft. at Rs. 1–12–0 per c.ft.	1,54,259	0	0
Rosewood 8,320 c.ft. at Rs. 2 per acre	16,640	0	0
Other saleable species—33,850 c.ft at Re. 1 per c.ft.	33,850	0	0
Villoni Series—			
Teak 19,000 c.ft at Rs. 1–12–0 per c.ft...	33,250	0	0
Rosewood 5,500 c.ft. at Rs. 2 per c.ft.	11,000	0	0
Vengai 1,500 c.ft. at Re. 1 per c.ft.	1,500	0	0
Total..	2,50,499	0	0
(3) *Evergreen Selection Working Circle—Kalar Series.*—By sale of sleepers to railway and other items like sale of rejected sleepers, etc.	3,39,700	0	0
Karianshola series—			
By sale of *Hopea, Mesua* and other saleable species 300,000 c.ft. at Re. 1 per c.ft. at sale depot, Pollachi	3,00,000	0	0
Total ..	6,39,700	0	0
(4) *Fuel Working Circle.*—By sale of the following coupes to contractors—			
Pothamadai Series 460 acres at Rs. 32 per acre	14,720	0	0
Keerapadi Series 285 acres at Rs. 55 per acre	15,675	0	0
Gudaravalli Series 489 acres at Rs. 20 per acre	9,780	0	0
Ayerangal Series 625 acres at Rs. 41 per acre	25,625	0	0
Pachathanni Series 530 acres at Rs. 34 per acre	18,020	0	0
Kottur Series 593 acres at Rs. 11 per acre	6,523	0	0
Nallar Series 508 acres at Rs. 4 per acre	2,032	0	0
Dhali Series 981·4 acres at Rs. 8 per acre	7,851	0	0
Kamanuthu Series 1,278·1 acres at Rs. 19 per acre	24,284	0	0
Chinnar Series 1,110 acres at Rs. 13 per acre	14,430	0	0
Amaravathi Series 937·2 acres at Rs. 8 per acre	7,498	0	0
Navalodai Series 554 acres at Rs. 18 per acre	9,972	0	0
Total ..	1,56,410	0	0
(5) *Bamboo Working Circle.*—By sale of the following coupes to contractors :—			
Pothamadai Series 15 coupes at Rs. 371 a coupe	5,565	0	0
Ayerangal Upper Series 15 coupes at Rs. 722 a coupe	10,830	0	0
Do. Lower Series 15 coupes at Rs. 282 a coupe	4,230	0	0
Pachathanni Series 15 coupes at Rs. 495 a coupe	7,425	0	0
Villoni Series 15 coupes at Rs. 513 a coupe	7,695	0	0
Thadaganachi Series 15 coupes at Rs. 417 a coupe	6,255	0	0
Punachi Series 15 coupes at Rs. 240 a coupe	3,600	0	0
Thalinji and Manjampatti Series 30 coupes at Rs. 618 for 2 coupes	9,270	0	0
Pundivendayam Series 15 coupes at Rs. 425 a coupe	6,375	0	0
Esaltittu-Mange Ar Series 15 coupes at Rs. 240 a coupe.. ..	3,600	0	0
Topslip Series 15 coupes at Rs. 600 a coupe	9,000	0	0
Tekkadi Series 15 coupes at Rs. 600 a coupe	9,000	0	0
Tellikal Series 10 coupes at Rs. 300 a coupe	3,000	0	0
Total ..	85,845	0	0

Serial number and item.	Amount. RS.	A.	P.
(6) *Minor Forest Produce Working Circle—*			
By sale of ivory and horns collected departmentally in all ranges at Rs. 500 a year ..	7,500	0	0
By sale of ten elephants (new captures) at Rs. 750 each.. ..	7,500	0	0
By sale of honey, wax and other minor produce collected departmentally in Tunacadavu range at Rs. 600 a year	9,000	0	0
By sale of the right to collect and sell other minor produce including honey, wax and gallnut in the following ranges :—			
Punachi range at Rs. 1,200 a year ..	18,000	0	0
Pollachi range at Rs. 1,150 a year ..	17,250	0	0
Udumalpet range at Rs. 2,900 a year ..	43,500	0	0
Total ..	1,02,750	0	0
(7) *Grazing Working Circle—*			
By sale of permits for grazing cattle and for removing fodder grass in the following ranges :—			
Punachi range at Rs. 100 a year ..	1,500	0	0
Pollachi range at Rs. 1,850 a year ..	27,750	0	0
Udumalpet range at Rs. 2,650 a year ..	39,750	0	0
Total ..	69,000	0	0
(8) *Miscellaneous—*			
Fines and forfeitures in all ranges at Rs. 500 a year ..	7,500	0	0
Drift and waifwood and other confiscated produce in all ranges at Rs. 240 a year ..	3,600	0	0
Rents on buildings at Rs. 2,300 a year ..	34,500	0	0
Other sources such as compounding fees, shooting licence fees, hire of elephants, etc., at Rs. 4,000 a year ..	60,000	0	0
Contribution from the Rajah of Kollengode for the maintenance of Dawson road, at an average cost of Rs. 300 a year ..	4,500	0	0
Total ..	1,10,100	0	0

Financial forecast for fifteen years from 1941–42 *to* 1955–56.

577. *Expenditure—*

(1) *Conversion Working Circle—*			
(*a*) *Demarcation and enumeration—*			
Survey, demarcation and enumeration of 15 clear-felling coupes and 15 subsidiary felling coupes in Mount Stuart series at Rs. 200 for one clear-felling and subsidiary felling coupes ..	3,000	0	0
Survey, demarcation and enumeration for 15 clear-felling coupes in Punachi series at Rs. 25 a coupe ..	375	0	0
(*b*) *Conversion and transport—*			
Felling, conversion and transport of 491,546 c.ft. of timber from Mount Stuart series to Pollachi sale depot at 6 annas per cubic foot ..	1,84,329	12	0
Felling, conversion and transport of 725,580 c.ft. of timber from Mount Stuart series to Pollachi sale depot at As. 6–6 per cubic foot ..	2,94,766	14	0
Conversion of 6,000 block sets of spokes and felloes at Rs. 2–8–0 a set ..	15,000	0	0
Conversion of 1,500 single sets of spokes and felloes at Rs. 4 per set ..	6,000	0	0
(*c*) *Regeneration—*			
Regeneration and formation of plantation till the end of third year—			
Mount Stuart Series—			
2,250 acres under ponam method at Rs. 25 per acre ..	56,250	0	0
746 acres without ponam at Rs. 37 per acre ..	27,602	0	0
Punachi Series—			
396 acres under ponam method at Rs. 25 per acre ..	9,900	0	0

Serial number and item.	Amount. RS.	A.	P.
(1) *Conversion Working Circle*—cont.			
(*d*) *Thinning*—			
Tending, marking and thinning—			
3,193 acres of 4-year old plantations at Re. 1 per acre ..	3,193	0	0
2,982 acres of 8-year old plantations at Rs. 1–8–0 per acre.	4,473	0	0
2,875 acres of 13-year old plantations at Rs. 2 per acre ..	5,750	0	0
1,816 acres of 22-year old plantations at Rs. 7–8–0 per acre.	13,620	0	0
57 acres of 34-year old plantations at Rs. 10 per acre ..	570	0	0
Total ..	6,24,829	10	0
(2) *Deciduous Selection Working Circle*—			
(*a*) *Demarcation and enumeration*—			
Survey, demarcation and enumeration of 15 selection felling coupes in Tunacadavu and two coupes in Villoni series at Rs. 50 a coupe	850	0	0
(*b*) *Conversion and transport*—			
Felling, conversion and transport of 130,318 c.ft. of timber from Tunacadavu series to Pollachi sale depot at 6 annas per cubic foot	48,869	4	0
Felling, conversion and transport of 26,000 c.ft. of timber from Villoni series to Pollachi sale depot at 8 annas per cubic foot ..	13,000	0	0
Total ..	62,719	4	0
(3) *Evergreen Selection Working Circle*—			
Kalar series—			
Extraction and transport of about 52,000 broad gauge sleepers from coupes VII to X to Pollachi at Rs. 3–13–0 a sleeper from coupe VII and Rs. 4–6–0 from the other coupes	2,20,750	0	0
Karianshola series—			
Survey, demarcation and enumeration of eight coupes in Karianshola series at Rs. 30 a coupe	240	0	0
Felling, conversion and transport to sale depot at Pollachi 300,000 c.ft.—*Hopea*, *Mesua* and other saleable species from Coupes I to X of Karianshola at 6 annas per cubic foot ..	1,12,500	0	0
Total ..	3,33,490	0	0
(4) *Fuel Working Circle*—			
Survey and demarcation of 15 coupes in each of the 12 series at Rs. 25 a coupe	4,500	0	0
Ponam regeneration including all operations in the first year and tending in the fourth year, 8,350 acres at Re. 1 per acre ..	8,350	0	0
Total ..	12,850	0	0
(5) *Minor Forest Produce Working Circle*—			
Departmental collection of honey, wax and other minor forest produce in Tunacadavu range at Rs. 250 a year	3,750	0	0
Cost of capturing 18 elephants at Rs. 500 an elephant including feed and upkeep	9,000	0	0
Total ..	12,750	0	0
(6) *Miscellaneous*—			
(*a*) Maintenance of reserve boundaries in all the ranges at Rs. 300 a year	4,500	0	0
(*b*) *Fire protection*—			
Cost of general protection including the pay of fire patrols, protection of timber depots, buildings and permanent preservation plot at Tellikal at Rs. 1,450 a year	21,750	0	
Special protection of teak plantations in Mount Stuart and Punachi series at Rs. 1,134 a year	17,010	0	0

Serial number and item.	Amount. RS.	A.	P.
(6) *Miscellaneous*—cont.			
(c) *Buildings and wells—New*—			
Construction of Foresters' quarters in two blocks for 4 foresters at Topslip at Rs. 1,500 per block	3,000	0	0
Construction of a permanent rest-house at Anagundi	1,500	0	0
Sinking a borewell at Anapadi	350	0	0
(d) *Buildings and wells—Old*—			
Improvement to Range clerks' quarters at Udumalpet	100	0	0
Annual repairs to buildings and wells at Rs. 2,010 a year (based on the average cost of maintenance)	30,150	0	0
(e) *Roads and bridges—New*—			
Construction of an extraction road in Villoni valley, 6 furlongs ..	2,000	0	0
Tekkadi leased forest—			
Construction of Sichali-Tellikal road, 4 miles, at Rs. 1,500 a mile	6,000	0	0
Extension of Top-Tekkadi road towards Tellikal, 3 miles, at Rs. 1,500 a mile	4,500	0	0
Extension of Tellikal-Padiparai road, 3 miles, at Rs. 1,500 a mile	4,500	0	0
Construction of Sichali-Anagundi road, 1½ miles, at Rs. 4,000 a mile	6,000	0	0
Kalar valley—			
Construction of an extraction road from Cinchona office down to coupes IX and X of Kalar felling series, 2 miles, at Rs. 2,000 a mile	4,000	0	0
Construction of a branch road from above towards coupe VIII of Kalar felling series, 4 furlongs, at Rs. 2,000 a mile ..	1,000	0	0
Repairs to new roads at an average annual cost of Rs. 1,500 a year for ten years	15,000	0	0
(f) *Roads and bridges—Old*—			
Repairs to roads and bridges at Rs. 12,000 a year (based on the average annual cost of maintenance)	1,80,000	0	0
Repairs to telephone (including line clearing) at Rs. 500 a year ..	7,500	0	0
(g) *Stores, tools and plant*—			
Purchase of stores and tools	10,100	0	0
(h) *Anti-malarial measures*—			
The cost of anti-malarial measures at an average cost of Rs. 1,000 a year	15,000	0	0
(i) *Live-stock*—			
Feed and upkeep of 29 elephants at Rs. 35 an elephant per month	1,82,700	0	0
(j) *Lease amount*—			
The annual lease amount to be paid to the Nambidi of Kollengode for the Tekkadi leased forests at Rs. 5,000 a year	75,000	0	0
Total ..	5,91,560	0	0
(7) *Establishment*—			
Pay of officers (District Forest Officer and Assistant)	3,15,000	0	0
Pay of establishment—Permanent	5,61,000	0	0
Do. Temporary	33,000	0	0
Travelling allowances	1,30,500	0	0
Fixed travelling allowances	37,500	0	0
Other compensatory allowances	9,000	0	0
Contingencies—Service postage and telegram charges, pay of menials, office expenses, tour charges and other charges	63,900	0	0
Chief Conservator's and Conservator's overheads	45,000	0	0
Expenditure on account of the Inspector of Live-stock	18,000	0	0
Total ..	12,12,900	0	0

578. Notes on Financial Forecast—

Revenue.

Timber.—Sale prices of timber have been based on average of past three years.

Punachi clear-felling coupes.—Estimated at Rs. 25 per acre, based on average of past five years.

Bamboo coupes.—Sale prices of bamboo coupes have been based on average of past five years.

Fuel coupes.—Sale prices of fuel coupes in each series have been based on average of past five years.

Minor produce.—Estimates based partly on past sales and on anticipated departmental collection.

Grazing.—Based on past averages modified by reduced grazing fees.

Thinnings.—(i) Estimated at 64 saleable poles per acre for Rs. 8 from thinnings in the thirteenth year.

(ii) Estimated at 80 saleable poles per acre for Rs. 30 from thinnings in the twenty-second year.

(iii) Estimated at 40 saleable poles per acre for Rs. 70 from thinnings in the thirty-fourth year onwards.

Expenditure.

Timber.—Rates adopted for conversion and transport of timber are based on the existing rates.

SECTION 2.—COST OF THE PLAN.

579. The working plan has cost Rs. 28,189–0–0 as detailed below :—

	RS.	A.	P.
1. Pay of officers—Voted	12,390	12	0
2. Pay of establishment—Voted—			
Permanent	6,579	7	0
Temporary	1,296	0	0
3. Travelling allowances—Voted	4,042	0	0
4. Fixed travelling allowances—Voted	887	0	0
5. Other compensatory allowances—Voted	249	10	0
6. Contingencies—			
Pay of menials, service postage stamps, office expenses, tour charges, other charges	620	13	6
7. Working plans—(For field work and Rs. 1,000 for printing key and management maps)	2,123	4	6
Total	28,188	15	0
	or		
	28,189	0	0

CHAPTER XIII.—SUMMARY OF PRESCRIPTIONS.

CHAPTER I.—BASIS OF PROPOSALS.

		Number of paragraph in working plan.
1	*General.*—The forests dealt with form the catchment area of numerous important water sources of surrounding plains	286
2	*Objects of management.*—The main objects of management are— (i) the protection and conservation of the forests on steep hill sides and high ranges, (ii) working the forests in a systematic manner (iii) improving the quality and quantity of the growing stock	287
3	General methods of treatment adopted have been mentioned	288–293
4	*Working Circles.*—Eight working circles have been constituted, and details regarding them have been given	294–302
5	*Period of the Working Plan.*—The period of the Working Plan is ten years, commencing from the 1st of April 1941	303

CHAPTER II.—WORKING PLAN FOR THE CONVERSION WORKING CIRCLE.

1	*Constitution.*—Localities suitable for conversion into plantations primarily of teak and areas already converted under earlier Working Plans have been included in this Working Circle	305
2	*Character of vegetation.*—Mixed deciduous type of forest with a large proportion of bamboo is met with in Tunacadavu range. In Punachi range the quality of growth is lower, with a higher proportion of *Anogeissus latifolia*	306
3	*Area.*—The area of the Working Circle is 17,904 acres	307
4	*Felling Series.*—The Working Circle has been divided into two felling series; details regarding them have been given	308–310
5	*Further subdivisions.*—The forests of Tunacadavu range and the Punachi Working Circle have been divided into blocks and compartments and the compartments allotted to the different Working Circles	311–313
6	*Stock-mapping.*—Areas suitable for planting with teak were stock-mapped and areas allotted for annual planting	314–315
7	*Silvicultural system.*—Clear-felling followed by concentrated regeneration is the system adopted	316
8	*Exploitable sizes* discussed and prescribed	317
9	*Choice of species given*	318
10	*Rotation* has been provisionally fixed at eighty years	319
11	*Periodic Blocks.*—The Working Circle has been divided into 8 periodic blocks and their areas have been given	320
12	*Allotment to Periodic Blocks.*—Details of allotment to Periodic Blocks have been given	321
13	*Regulation of yield.*—Yield is to be regulated by area	322
14	*Areas of clear-felling coupes.*—Area of coupes have been given	323
15	*Gross and net areas of clear-felling coupes.*—Statement showing gross and net areas have been given	324
16	*Subsidiary fellings.*—Cycle for subsidiary felling fixed at 20 years—subsidiary fellings have not been prescribed for Punachi Series—Tabular statement of subsidiary fellings have been given	325–327
17	*Yield from clear-fellings.*—Statement of anticipated outturn from clear-fellings have been given	328 & 329
18	*Yield from subsidiary fellings.*—Statement of yield from subsidiary fellings has been given	330–331
19	*Demarcation of coupes.*—Rules for demarcation of coupes have been given ..	332
20	*Marking.*—Marking rules have been given	333
21	*Extraction scheme.*—Extraction scheme for each coupe should be prepared in advance	334
22	*Felling logging, etc.*—Felling, conversion and transport details have been given ..	335–341
23	*Exploitation by contractors.*—Exploitation by contractors to continue to Punachi Series	342

	Number of paragraph in working plan.
24 *Clearing and burning.*—Details regarding clearing and burning the area to be regenerated have been given	343
25 *Lining and staking.*—Espacement will continue at 6′ × 6′ and in view of the mechanical thinnings prescribed accuracy in alignment is to be aimed at ..	344
26 *Inspection paths.*—Permanent properly graded inspection paths will be made ..	345
27 *Method of regeneration and allotment of ponams.*—Ponam regeneration (inter cultivation of tree crop with field crops) will be the principal method of regeneration failing which the ordinary plantation practice will be adopted. Allotment for ponam will be made soon after lining and staking in April	346–347
28 *Choice of species.*—Teak will be the principal species to be planted. Rosewood will take the place of teak in rocky areas of limited extent that exhibit themselves on clearfelling. Sandal will be introduced as a subsidiary species in Punachi Series	348
29 *Nursery practice.*—Details of nursery practice have been given	349–353
30 *Stumps.*—Details of stumping practice have been given	354
31 *Cost of stumps.*—Cost of stumps—should not exceed Rs. 4, per acre of 6′ × 6′ planting	355
32 *Planting of stumps.*—Details regarding the planting of stumps of teak and rosewood have been given	356
33 *Dibbling of sandal.*—Inspections regarding the dibbling of sandal have been given	357
34 *Casualties.*—Instuctions reagarding replacemnet of casualties have been given ..	358
35 *Drainage.*—Provision has been made to drain off rinfall excess, from lands which become water-logged by cutting inexpensive drains	359
36 *Ponam crops and weeding.*—Instructions reagarding weeding the regeneration area and the harvesting of the field crop have been given	360
37 *Cutting back.*—Cutting back of damaged seedlings and reduction of multiple leaders to one dominant shoot have been prescribed	361
38 *Tending.*—The details of second year and third year treatment have been given.	362–363
39 *Cost of formation.*—Plantations are estimated to cost Rs. 25 if raised with *ponam* crops and Rs. 37 if raised in the ordinary manner	364
40 *First thinning.*—Instructions for the first thinning have been given	365
41 *Preparation of Quality Class Maps.*—A quality class map will be prepared by the District Forest Officer when a plantation is 6 or 7 years old	366
42 *Second thinning.*—Instructions regarding the carrying out of a second thinning have been given	367
43 *Silvicultural thinning.*—Details regarding silvicultural thinnings of plantations have been given	368
44 *Third and subsequent thinnings.*—Details regarding third and subsequent thinnings have been given	369
45 *Tabular statement of thinnings.*—Tabular statement of thinning operations has been given	370
46 *Demarcation.*—Demarcation of plantations will be done with the help of teak wooden boards with the year of formation engraved on them and fixed on trees out of reach of elephants	371
47 *Inspection paths.*—Inspection paths and roads inside plantations will be kept cleared	372
48 *Fire protection.*—Fire protection measures have been prescribed	373
49 *Cost of fire protection.*—Annual cost of fire protection is expected to be Rs. 1,134 ..	374
50 *Control forms and other records.*—Control forms and other records which have to be maintained have been mentioned	375 & 376

CHAPTER III.—WORKING PLAN FOR THE DECIDUOUS SELECTION WORKING CIRCLE.

1 *General constitution.*—General location of the Deciduous Selection Working Circle described	377
2 *Area.*—Area of the Working Circle is 12,768 acres out of which 12,268 acres fall in Tunacadavu range and 500 acres in Pollachi range	378
3 *Character of the vegetation.*—Character of vegetation has been described	379
4 *Blocks.*—Location of the blocks have been given	380
5 *Compartments.*—Formation of sub-compartments has been mentioned	381
6 *Felling series.*—Constitution into three felling series has been discussed	382

	Number of paragraph in working plan.
7 *Analysis and valuation of the crop.*—The analysis and valuation of the crop in the series have been given	383—385
8 *Silvicultural system.*—Selection *cum* Improvement fellings have been described ..	386
9 *Ulandi felling series.*—Ulandi felling series will be given rest until sleeper transport facilities are brought into existence	387
10 *Exploitable size.—Tunacadavu series.*—For Tunacadavu series a girth limit of 7½ feet at breast height has been allowed to continue	388
11 *Exploitable size—Villoni series.*—For Villoni series a breast height girth of 6 feet has been fixed	389
12 *Rotation.*—Rotation for Selection Working Circle has been fixed at 160 years ..	390
13 *Felling cycle.*—A felling cycle of 40 years has been adopted	391
14 *Regulation of fellings.*—Fellings will be regulated by area	392
15 *The annual coupe.*—The size of the annual coupes has been given	393
16 *Selection areas included in Conversion Working Circle.*—Special prescriptions for selection areas included in Conversion Working Circle have been given	394
17 *Estimate of yield.*—Mode of calculation of yield has beengiven	395
18 *Yield from areas not enumerated.*—Yield from areas not enumerated have not been given	396
19 *Demarcation and survey.*—Demarcation by cut lines wherever necessary has been prescribed	397
20 *Marking.*—Marking rules for Tunacadavu and Villoni series have been given ..	398 & 399
21 *Extraction scheme.*—Extraction scheme for the coupes should be drawn up in advance	400
22 *Felling, Logging, Squaring, etc.*—Felling, logging, squaring, etc., will be as laid down for the Conversion Working Circle	401
23 *Exploitation of Villoni series.*—Exploitation of Villoni series discussed	402
24 *Tabular statement of fellings.*—Tabular statement of fellings and yield have been given	403
25 *Control records.*—Control of records will be maintained	404

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1 *General constitution.*—This Working Circle is composed of Karianshola and the accessible Evergreen forests near Cinchona plantations in the Kalar valley ..	405
2 *Character of the vegetation.*—Character of vegetation has been described	406
3 *Area.*—The area of the Working Circle is 6,945 acres	407
4 *Felling Series.*—Two felling series have been constituted	408
5 *Compartments.*—Compartments have been formed in the Karianshola series ..	409
6 *Analysis and valuation of the crop.*—Analysis and valuation of the crop in both the series have been given	410 & 411
Karianshola Felling Series.	
7 *General.*—The exploitation proposed for the Karianshola should be regarded as experimental	412
8 *Silvicultural system.*—Silvicultural system will be very light selection fellings of saleable species combined with experimental artificial regeneration under the top canopy over 5 to 10 acres every year in combination with cardamoms ..	413
9 *Exploitable size.*—Exploitable size for the different species have been given ..	414
10 *Rotation.*—A rotation of 150 years fixed arbitrarily by Mr. Laurie will be in force, since it is not of great importance	415
11 *Felling cycle.*—The felling cycle of 25 years will continue	416
12 *Estimate of annual yield.*—Annual outturn is expected to be 30,000 c.ft.	417
13 *Demarcation and survey of coupes.*—Demarcation of coupes will be by cut lines ..	418
14 *Marking rules.*—Marking rules have been given	419
15 *Extraction scheme.*—Extraction and marketing of produce will be the same as for the Conversion Working Circle	420
Kalar Felling Series.	
16 *General.*—A portion of the Kalar felling series falls within the area taken up for further planting with Cinchona	421

(ii) Chapter XIII: Summary of prescriptions chapter IV: Working Plan for the evergreen selection working circle:-

Delete: Items 31 to 41.

Contr W P O Ref 958/52 T d 26.9.52; C.C.F. Mis 37 / 19.1.53

		Number of paragraph in working plan.
17	*Object of management and silvicultural system.*—Object of management will be the exploitation of all saleable timber in areas which will be assuredly taken up for cinchona planting in the near future and conservative selection fellings in other areas	422 & 423
18	*Species to be exploited.*—*Mesua ferrea* is the only species which can be exploited profitably	424
19	*Exploitable size.*—Selection girth will be 7 feet at breast height for all species ..	425
20	*Rotation.*—Rotation has not been fixed since only mature and over mature trees are exploited	426
21	*Felling cycle.*—Felling cycle has been fixed at 10 years. A second felling cycle has not been fixed for reasons mentioned	427
22	*Coupes.*—The last four coupes will be worked during the balance of the felling cycle	428
23	*Yield.*—Yield will be regulated by area. The coupes formed are expected to yield equal number of *Mesua ferrea* trees over 7 feet breast height girth over bark	429
24	*Roads.*—Construction of an exploitation road from Cinchona office to Kalar has been discussed	430
25	*Marking rules.*—Marking rules have been given	431
26	*Felling and conversion.*—Rules for felling and conversion have been given ..	432
27	*Specification of sleepers.*—The current specification for Broad Gauge sleepers as modified from time to time will be adhered to	433
28	*Control of fellings.*—Simple rules for control of fellings have been given	434
29	*Order of felling.*—Order of felling has been suggested	435
30	*Forecast of yield.*—Yield statement has been given	436
31	*Experimental artificial regeneration—General.*—Large scale experimental plantations of evergreen species have been proposed to be done in the Karianshola ..	437
32	*Locality.*—Experiments will be confined to areas below the reservoir which supplies the Topslip settlement	438
33	*Annual area.*—Annual area will be five acres for the first five years and if the results are encouraging the annual planting area will be increased to 10 acres	439
34	*Species to be planted.*—The species to be planted have been given	440
35	*Preparation of site.*—Rules for the preparation of site have been given	441
36	*Planting.*—Details for planting have been given	443
37	*Planting with cardamoms.*—Details for planting with cardamoms in conjunction with tree plants have been given	444
38	*Time of planting.*—June will be suitable for dibbling seeds and planting ..	445
39	*Tending.*—Tending has been discussed	446
40	*Control records.*—A list of control records to be maintained has been given ..	447
41	*Report to Chief Conservator.*—A report on the results achieved has to be sent to the Chief Conservator at the end of the fourth year of operations	448

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CHAPTER V.—WORKING PLAN FOR THE FUEL WORKING CIRCLE.

1	*General constitution.*—Fuel Working Circle has been constituted to include the accessible portions of the reserves. Its extent is 20,775 acres and is confined to Udumalpet and Pollachi ranges	449
2	*Character of the vegetation.*—The vegetation occurring in the working circle can be divided into two types and quality classes based on the rainfall	450
3	*Felling series.*—The Fuel Working Circle has been divided into twelve felling series. Kottur and Dhali series have been reconstituted. The details of areas have been given	451–453
4	*Silvicultural system.*—Simple coppice system with the reservation of vigorous *Sapindus* and tamarind trees has been prescribed	454
5	*Rotation.*—Rotation has been fixed at 30 and 40 years for the better and inferior areas respectively	455
6	*Regulation of working.*—Felling will be regulated by area	456
7	*Method of executing fellings.*—Mode of execution of fellings and procedure to be adopted for arrear coupes have been given	457
8	*Agency of felling.*—Contract method of working the coupes has been prescribed ..	459
9	*Demarcation and survey.*—Demarcation of coupes will be by cut lines 10 feet wide.	460

Chapter XIII - Summary of Prescriptions.

Chapter VII - Working Plan for the Minor Forest Produce Working Circle.

Page 140 - Add the following.

"6(a) - Rola bark - Lease units and period for Cassia Fistula

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	Number of paragraph in working plan.
10 *Leases.*—Lease period will be the official year and before August the contractor should hand over half the coupe to the department for regeneration in the following north east monsoon	461
11 *Felling rules.*—Felling rules have been given	462
12 *Statement of fellings.*—Statement of fellings has been given	463
13 *Necessity for artificial regeneration.*—Necessity for artificial regeneration stressed ..	464
14 *Ponam and rab regeneration.*—*Ponam* regeneration only is to be encouraged and there will be no *rab* sowings	465
15 *Area to be regenerated.*—Area to be regenerated to be decided by the District Forest Officer with reference to the local conditions and season	466
16 *Choice of species.*—A wide choice of species with regeneration details regarding them has been given	467
17 *Teak.*—In certain series receiving good rainfall and having a rotation of 30 years introduction of teak with stumps has been advocated	468
18 *Seed selection and storage.*—Instructions regarding seed collection and storage have been given	469
19 *Ponam regeneration—General.*—Necessity for making ponam regeneration has been stressed	470
20 *Regeneration.*—Details of the ponam method of cultivation have been given. These are only noticed for guidance	471
21 *Tending.*—Tending will be done by the ponamdars till he relinquishes the regeneration area and thinning out crowded group of seedlings will be done departmentally when required	472
22 *Demarcation.*—Instructions regarding demarcation of coupes have been given ..	474
23 *Supply of local demand.*—Contractor should make arrangements to meet local demand for the products of the coupe at rates fixed by the District Forest Officer from time to time	475
24 *Statistics.*—Contractor has to furnish certain statistics	476
25 *Grazing.*—Coupes will be normally closed to general grazing for ten years including the year of felling. Rotational grazing might however, be organized in coupes after they have had four years closure with Conservator's permission. Closed areas should be clearly distinguished	477
26 *Fire protection.*—No special fire protection is considered necessary	478
27 *Control.*—Control records to be maintained have been given	479

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1 *General constitution and area excluded.*—All bamboo area with the exception of an area in Udumalpet range have been included in the Bamboo Working Circle ..	480 and 481
2 *Character of the vegetation.*—Both *Bambusa arundinacea* and *Dendrocalamus strictus* occur	482
3 *Silvicultural system.*—Selection thinning will be the system prescribed	483
4 *Felling cycle.*—A felling cycle of three years has been prescribed	484
5 *Felling series.*—14 felling series have been formed; their distribution and areas have been given	485
6 *Regulation of working.*—Yield will be regulated by area. Natural features have been chosen as the boundaries of coupes which have been made equiproductive.	486
7 *Agency of exploitation.*—Contract method of working has been prescribed	487
8 *Leases.*—Financial year will be the lease period	488
9 *Felling rules.*—Felling rules have been given	489
10 *Tabular statement of coupes and fellings.*—Tabular statement of coupes and fellings has been given	490
11 *Grazing.*—The Working Circle will be open to grazing	491
12 *Fire protection.*—No special methods of fire protection have been prescribed ..	492
13 *Control*	493

CHAPTER VII.—WORKING PLAN FOR THE MINOR FOREST PRODUCE WORKING CIRCLE.

1 *Constitution.*—The Working Circle covers the whole of the Coimbatore South Forest Division	494
2 *Main items of produce.*—The important items of minor forest produce occurring in the division have been given	495
3 *Departmental collection.*—Departmental collection has been advocated for certain minor products	496

cassia fistula (Rela) bark have been given - 499 (a)

(C.P. No. Mis. 501 d/ 6.12.50)

		Number of paragraph in working plan.
4	*Punachi range.*—The lease relating to the Punachi Range has been discussed ..	497
5	*Gallnuts.*—Prescriptions relating to gallnut lease have been discussed	498
6	*Avaram bark*—Lease units and period for *Cassia auriculata* (*Avaram*) bark have been given	499
7	*Other minor produce.*—Prescriptions relating to other minor products have been given	500
8	*Euphorbia bark.*—Investigation of the demand for *Euphorbia* bark may be done ..	501
9	*Control.*—Control returns have been prescribed	502
	CHAPTER VIII.—WORKING PLAN FOR THE GRAZING WORKING CIRCLE.	
1	*Constitution.*—Constitution of the Grazing Working Circle has been given	503
2	*Concessions.*—The grazing concessions which have been recognised have been given	504
3	*General grazing.*—Rates for general grazing have been given	505
4	*Penning.*—The penning rules have been given and also a list of cattle pens of the division	506
5	*Improvement of watering facilities.*—A list of water-sources which can be improved at a reasonable cost has been given	507
6	*Inoculation.*—Inoculation of cattle prior to their admission into the reserves and bison areas will not be insisted upon in future	508
7	*Closure of burnt areas.*—Rules regarding the closure of burnt areas not above 1,000 acres have been given	509
8	*Control.*—Control forms for this Working Circle have been given in Chapter XI ..	510
9	*Opening of fuel coupes closed to grazing.*—Opening of fuel coupes, which have had closure from 3 to 5 years, to Rotational grazing has been discussed	511
10	*Grazing blocks and paddocks.*—The formation of grazing blocks and paddocks is discussed	512
11	*Period.*—Scheme of rotation of grazing has been discussed	513
12	*Intensity of grazing or carrying capacity.*—The grazing possibility has been discussed	514
13	*Grazing fee.*—This special grazing will be covered by special grazing permits ; the rates will be fixed by the District Forest Officer for each locality with reference to the demand	515
14	*Control.*—Control records have been prescribed	516
15	*General.*—General factors regarding the introduction of Rotational grazing have been discussed	517
16	*Standard rules.*—Standard rules governing control of cattle in the Special Rotational grazing blocks have been given	518
17	*Periodicity.*—The periodicity of movement of cattle under different conditions has been given	519–521
18	*Record of movement.*—A form for recording the movement of cattle has been given	522
	CHAPTER IX.—WORKING PLAN FOR THE PROTECTION WORKING CIRCLE.	
1	*Constitution.*—Areas not included in the Working Circles formed for exploiting major products have been included in the Protection Working Circle	523
2	*Prescriptions.*—Prescriptions for the management of the Protection Working Circle have been given	524
3	*Game Preserve.*—The grass hills round Akkamalai in Punachi range has been constituted into a " Game Preserve ". The rule for management of this area have been given	525
4	*White Bison.*—In certain areas to which white bison normally resort to, the shooting of the animal is prohibited	526
5	*Shifting cultivation.*—The future regulation of shifting cultivation has been discussed	527
6	*Enumeration.*—A statement showing the probable yield of railway sleepers from *Mesua ferrea* trees occurring in certain ever-green forests has been given ..	528
7	*Treatment.*—Future treatment of these areas have been given	529
8	*Area outside Kalar Felling Series.*—Area available for exploitation outside the Kalar Felling Series has been described	530
9	*Vegetation.*—A description of the vegetation has been given	531

Number of paragraph in working plan.

10 *Estimate of stock.*—About 90,000 broad gauge sleeper units are expected from this area by exploiting *Mesua ferrea* trees over 7 feet breast height girth 532

11 *Extraction system.*—The extraction system for the above area has been fully discussed. The formation and maintenance of a good metalled road is expected to cost about a lakh of rupees 533

12 *Cost.*—The probable cost of production of a broad guage unit will be Rs. 6 inclusive of overheads 534

13 *Conclusion.*—If the Cinchona Department shares part of the cost of the road system and the price of sleepers raise to Rs. 7 per broad guage sleeper, extraction from the above locality is expected to pay and the project will be worth closer investigation 535

CHAPTER X.—ESTABLISHMENT AND LABOUR.

1 *Establishment.*—The existing establishment considered sufficient 536

2 *Labour.*—Increase of Kadir labour force sufficient to tackle 200 acres of regeneration area has been suggested 537

CHAPTER XI.—MISCELLANEOUS PRESCRIPTIONS AND REGULATIONS.

1 *State and District boundaries.*—State and District boundaries will be maintained in accordance with the orders in force 538

2 *Reserve boundaries.*—Exterior reserve forest boundaries will be maintained correctly. 539

3 *General.*—General fire protection measures for Tunacadavu range which will be by burning broad fire lines with the help of guide lines have been prescribed and details have also been given 540

4 *Cost of general protection.*—Cost of general fire protection including cost of fire patrols, etc., for Tunacadavu range is expected to be Rs. 1,150 per year 541

5 *Plantations.*—Teak plantations will be protected by external and interior fire lines and this is expected to cost Rs. 1,096 for the next 15 years 542

6 *General protection.*—General fire protection measures for the Punachi range have been described and it is expected to cost Rs. 300 543

7 *Plantations.*—Fire protection of the plantations of Punachi range has been prescribed and it is expected to cost Rs. 38 per annum 544

8 *Forester's quarters.*—Quarters for four Foresters at Topslip will be built in two blocks as soon as funds are available. Each block is expected to cost Rs. 1,500. 545

9 *Anaigundi rest shed.*—A rest shed at Anaigundi has been suggested to be built as soon as funds are available 546

10 *Bore wells.*—A bore well for Anaipadi has been suggested 547

11 *Range Clerk's quarters.*—Improvements to Range Clerk's quarters at Udumalpet have been suggested 548

12 *Maintenance of roads.*—All roads must be maintained in good condition to the extent necessary 549

13 *New construction.*—A programme for the construction of new roads in Tunacadavu range has been given 550

14 *Road system in Kalar valley.*—A new road for serving the sleeper coupes VIII to X of Kalar valley has been described 551

15 *General.*—No other permanent roads are necessary in Punachi road 552

16 *Criticism of present system.*—The defects of the existing system of supply of agricultural implements from the Pundi plateau have been described 553

17 *Agricultural implements.*—An alternative system of supplying agricultural implements from fuel coupes, a year previous to their being worked for fuel, has been suggested to be tried for a minimum period of three years. The future of this method of supply will depend on the results of the working 554

18 *Formation of propogation centres.*—Formation of Sandal Propogation centres will be dropped on the Pundi plateau but they will be continued in the Thalinji. Manjampatti valley. The details of the operation have been given .. 555

19 *Sandal kumri.*—Sandal kumri has been proposed in the areas set apart for shifting cultivation by Pulayars, on the Pundi-Mavadap plateau. Rewards also have been suggested 556

20 *Elephants.*—No increase in the stock of elephants is considered necessary 557

21 *Elephant capturing.*—Elephant capturing operations will be continued on the same lines as at present 558

22 *Stores and tools.*—Provision has been made for the purchase of Stores and tools .. 559

	Number of paragraph in working plan.
23 *Poverty of growth.*—The poverty of tree growth round the Thirumurthi temple and the present permit system for removal of dead fuel has been described ..	560
24 *Artificial regeneration.*—Artificial regeneration by the rab method in 20′ × 20′ patches with *Acacia planifrons* and *Melia indica* has been suggested	561
25 *Lease for Cardamom cultivation.*—Lease of the ever green forests occurring in the upper reaches of Palakadavu valley in blocks of not less than 100 acres, for cardomom cultivation has been suggested as soon as the present disease affecting cardamom in Anamalais abates or is brought under control	562
26 *Formation of permanent grove.*—Formation of a permanent grove round Wood's Grave and its further treatment have been described	563
27 *Malarial prophylaxis.*—Provision has been made to continue the anti-malarial measures at present adopted in the division. In future these measures will be carried out by specially trained Foresters. The present arrangement for treating sick persons at Topslip has been described. Annual cost of anti-malarial measures is estimated at Rs. 1,000	564–566
28 *Control records.*—Control records which have to be maintained have been described in detail	567–570
29 *Other records.*—Other records like Nursery Ledger, Regeneration Ledger and Plantation History will also be maintained	571–573
30 *Fire maps.*—Fire maps will be maintained	574

CHAPTER XII.—FINANCIAL FORECAST AND COST OF THE PLAN.

1 *Abstract of financial forecast.*—Abstract of financial forecast has been given. Annual net revenue is estimated at Rs. 34,151	575
2 *Revenue.*—Details of the forecast of revenue for fifteen years from 1941–42 have been given	576
3 *Expenditure.*—Details of the forecast of expenditure for fifteen years from 1941–42 have been given	577
4 *Explanatory notes.*—Explanatory notes relating to items of Revenue and Expenditure have been given	578
5 *Cost of the plan.*—The Working Plan has cost Rs. 28,189	579

APPENDIX A.

(a) ANAMALAI RESERVED FOREST.

I

RIGHTS ADMITTED IN RESERVED FORESTS.

The following are the rights of way admitted and recorded and they are 10 yards wide unless otherwise specified:—

(1) *Right of way from survey field No. 1026 of Vettaikarampudur village to Malai-Perumalswamikoil.*—The right of way to the temple is admitted for the Mulcer community, and it enters the Anamalai reserve between cairns Nos. 162 and 163 at the south-west corner of survey No. 1026 of Vettaikarampudur village and runs in a slightly south-easterly direction for about one furlong to the temple.

(2) *Right of way by the path now in use to the channel and Public Works Department anicut irrigating the Atur lands* (the latter is on the Chinnar situated about half a mile within the reserve south of Muttithorai). The path enters the Anamalai reserve between cairns Nos. 262 and 263 on the south side of survey field No. 1454 of Kuttur village and runs westward within the reserve almost following the reserve boundary to the anicut on the Chinnar from whence the channel takes its source. The distance of the path is about half a mile.

(3) *The Anamalai ghat road* (right of way from Kottur to Anamalai Coffee Company's Coffee estates situated on Punachi hills and in that neighbourhood. This is now known as the Punachi road. The right of way given at the time of settlement was as far as the waterfall estate only. After the opening up of coffee estates on the Anamalais this was converted into a pucca metalled road, and extended further on southwards. This is now termed as the Anamalai Public Works Department Ghat road and its description is given below). The road begins at Vannanthorai and enters the Anamalai Reserve Forest between cairns 274 and 275 at the south-west corner of field No. 405 of Kottur village, runs first in a south-westerly direction for about half a mile and then turning south-east, it runs up the ghat and passes through St. Catherine and waterfall estates and leaves the latter estate at about the first furlong after the 14th milestone, then it turns south as far as the 19/4 milestone, then it turns south-west and ends at 31/6 milestone. The total distance from the reserve boundary is about 31 miles, and the average width is 100 feet. Right of way over the Anamalai ghat road is admitted to a width of 200 feet at the 7th mile, 5th furlong and the 14th mile 3rd furlong instead of 100 feet as originally admitted.

NOTE.—At Attakatti the 7th mile and at Iyerpady 20/2 mile the Public Works Department has constructed two rest-houses with out-houses over areas of about ten and five acres, respectively. The road to the rest-house at Iyerpady branches from the main road at 19/4 milestone.

(4) *Villoni bridle path.*—This begins at about the bridge near the second milestone in the Anamalai ghat road (I-3) and runs almost south-west and meets the Anamalai ghat road at 24/3 milestone. The length of the road is 14 miles and the average width, 30 feet.

(5) *Iyerpady branch road.*—This road branches from the Anamalai ghat road (I-3) at 19/4 milestone and runs in a south-easterly direction to Iyerpady, the distance being 6 furlongs.

(6) *Right of way to the Gopalaswami and Thadaganachi Amman koil situated on Thadaganachi hill south-east of Kottur, Pollachi taluk* (II-2 and 3).—This path enters the Anamalai reserve between cairns 474 and 475 on the west side of survey field No. 221 of Thorayur village, and runs south-east passing along Gopalaswami koil and Vengaipatti to Thadaganachi Amman koil, the distance being about 4 miles. The right to use the path throughout the year is subject to the restriction that fires shall only be kindled in the places set apart on the hill for that purpose by the Forest Department, and that no fire should be carried along this path.

(7) *Right of way to Thadaganachi Amman and Gopalaswami koils, Pollachi taluk (II-2 and* 3).—The claim to right of way over the Kundruttithadam is granted to the people of Jallipatti to go to Thadaganachi Amman and Gopalaswami koils on Thadaganachi Malai subject to the restrictions given in the above item. The path enters the Anamalai reserve between cairns Nos. 490 and 491 on the southern side of Survey No. 420 of Jellipatti village and runs along the Kunduruttipallam and meets the path in item (I-13) above west of Vengaipatti. The distance of the path is about 1½ miles.

(8) *Right of way over Nuthipallathadam to Thadaganachi Amman koil (item No. II-*3).—The claim to the right of way to Thadaganachi Amman koil is granted to the ryots of Arthanaripalaiyam by the path now ordinarily used for that purpose, provided that they do not kindle fires except in the places selected for that purpose by the Forest department, and that no fire is carried along the path. The path enters the Anamalai

reserve between cairns Nos. 528 and 529 at the southern side of Survey No. 188 of Arthanaripalaiyam village, and runs in a south-eastely direction up to the jungle stream for about one mile, and then turns west and goes to Thadaganachi Amman koil. The total distance of the path is about 2 miles.

(9) *Right of way to the Gopalaswami and Thadaganachi Amman koils on the Thadaganachi hill from Paruthiyur.*—The right of way over the path to the temples is given to the ryots of Paruthiyur subject to the restrictions that no fire shall be kindled within the reserve except in the places set apart for that purpose by the Forest department. It enters the Anamalai reserve between cairns Nos. 586 and 587 on the western side of Survey No. 406 of Paruthiyur village and leaves it again between cairns Nos. 587 and 588 on the western side of Survey No. 430 of the same village. It re-enters the reserve after crossing and re-crossing the Nalar river about a furlong north-east of cairn No. 610 and runs in a south-westerly direction for about a mile and thence north-west passing along Puliampatti, Sallemorapatti, Setpati, to clinometric point 3621 where it meets the path in item (No. I-6). The distance of the path is about 4 miles.

(10) *Right of way from Dhalli to Ponnalamman temple* (II-4).—Right of way over the path to Ponnalaman temple is granted to the public. Cooking will not be permitted here, or kindling of fires. This may be done, however, outside the reserve limits a few yards off. The inhabitants, Mulcers and Puliars of Kil-Kuru-Malaipatti, are permitted to use the path.

The path enters the Anamalai reserve at the west side of Survey No. 904 of Dhalli village between cairns Nos. 145 and 146 and runs in a south-westerly direction for a few yards to the temple.

(11) *Right of way from Dhalli to Tirumurthi temple* (II-5).—The claim to right of way over the path to Tirumurthi koil is granted to all persons desirous of visiting the temple.

The path enters the Anamalai reserve between cairns Nos. 222 and 223 at the south side of Survey field No. 331 of Dhalli village and runs in a southerly direction for about two furlongs to the temple.

(12) *Right of way to Tirumurthi koil to go to and come from the bathing place at Panchalingam about half a mile up the river above the koil.*—In continuation of the path above (I-11) right of way is given to go to and come from the bathing place at Panchalingam. The distance is about half a mile, up the river from Tirumurthi koil.

(13) *Right of way from Dhalli to Mamangathamman Koil (II-7), Udumalpet taluk.*—The path in question is a continuation of the path in item (I-11) supra and it runs south for about 1½ miles along the path to Kurumalai used by hill tribes and after crossing a tributary of the Palar, it ends at Mamangathamman Koil.

(14) *Right of way from Dhalli to Bodinayakkam Koil (II-8), Udumalpet taluk.*—Right of way to Bodinayakkam koil is given to the public. The path enters the Anamalai reserve between cairns Nos. 262 and 263 at the south-east corner of field No. 344 of Jellipatti village and runs for about 2 miles in a southerly direction to the koil.

(15) *Right of way to the temple of Yelumalayan Venkatachalapathi koil (II-9)*, Udumal*pet taluk*).—The right of way is subject to the following conditions:—

(*a*) The path may be used by all classes and castes.

(*b*) The path to be ordinarily used by the public frequenting the koil on Saturday except during the month of Puratasi (September and October) when it may be used daily.

(*c*) All cooking and lighting of fires for that or any other purpose is to be restricted to the tope round the temple or to such other places as may be set apart for that purpose by the District Forest Officer. The path in question enters the Anamalai reserve between cairns Nos. 323 and 324 and it is about one mile west of Jambimalai from field No. 453 of Manupatti village. It runs first southward and then in a slightly south-westerly direction for a distance of about 2½ miles to the koil.

(16) *Right of way originally admitted from Manupatti village to Kodanthur since converted into a metalled road by the Public Works Department and termed as the Pallapoliem-Chinnar road.*—The road enters the reserve at its sixth mile, first furlong on the south side of survey field No. 449 of Manupatti village and runs in a southerly direction as far as 13/4 milestone. Thence it runs south-west till it meets the southern boundary of Anamalai reserve. The distance of the road from the reserve boundary as far as it meets the Anamalai reserve is about 9¼ miles. The average width of the road is 66 feet.

(17) *Right of way from Kallapuram to Mangipatti of Madura district or to Anjinad in the Travancore territory or to Arikampatti of the Coimbatore district, Udumalpet taluk.*—The claim to right of way over the path is given to the public, to merchants, to Pulayars of Thalinji and all others desirous of proceeding over the path, until it enters the Amaravathi reserve. At the time of settlement the portion of the right of way as far as it lies in Anamalai reserve was a path only and subsequently this has been converted into a road by the Forest Department.

It enters the reserve at trignometrical point 1124 just to the east of the cairn No. 458 and runs in a south-westerly direction for about three and a half miles through the reserve and enters the Amaravathi reserve near the anicut on the Amaravathi river whence Krishnier's channel starts.

(18) *Right of way to Mukundapar koil* (II-10).—The path enters the Anamalai reserved forest just near cairn No. 474 on the south side of survey field No. 448 of Kallapuram village and runs southwards to the above temple. The distance of the path is about four miles.

(19) *The ghat road.*—The ghat road enters " Andiparai " or " Mary estate " on its northern boundary, a couple of yards south of the stone marking the trijunction of the Waverly estate, Anamalai reserved forest No. IV of this block, runs south-west for a distance of about 5 chains; thence runs due south through the cultivated portion of the estate within the reserve until it reaches its southern limits, when it runs south-east for a distance of about 5 chains; then going north-east for a distance of about 8 chains when it runs south-east until it leaves the estate crossing the boundary a couple of chains south of the first stone, south of the southernmost limit of the Nesbit estate. Width 14 feet exclusive of side drains and is open for men, cattle and carts.

(20) *The bridlepath.*—It enters the " Andiparai " or " Mary estate " from the waterfall estate about 13½ chains north-west of the point of trijunction of the waterfall and Nesbit estates with this block, runs first due west and then due south when it enters the cultivated portion of the area and then north-west where it joins the ghat road. It leaves the ghat road at the point where the road runs south-east before it leaves the limits of the estate, runs first south-south-east and then west and then south-east until it touches the eastern boundary of the reserve; thence it runs along the boundary for about 15 yards, turns south-west, east and south and leaves the block about 20 chains south of the point of exit of the ghat road in item No. 26. Width, 6 feet and is open for men and cattle.

II

The following temples with the space specified round each of them for purposes of worship are excluded from reservation and retained as enclosures within the Anamalai reserve with access as provided under each:—

(1) *Malai Perumalswami koil.*—The temple is situated about a furlong south of survey field No. 1026 of Vettaikaranpudur village and consists only of a stone under a tree. No fire is to be lighted at the temple for cooking or for any other purpose. An area of two acres round the temple will be allotted for the use of the pilgrims. Access to the koil will be by right of way No. (I-1).

(2) *Gopalaswami koil.*—The temple is situated within the Anamalai reserve about three furlongs south of survey field Nos. 445 and 444 of Jellipatti village. An area of 2 acres round the temple will be set apart for use of the pilgrims. Access to the koil will be by rights of way Nos.I-6, 7, 8 and 9.

(3) *Thadaganachi Amman koil.*—The temple is situated within the Anamalai reserve about two furlongs south of Thadaganachi malai. An area of ten acres round the temple will be set apart for use of the pilgrims. Access to the koil will be by rights of way in Nos. I-6 to 9.

(4) *Ponnalamman temple.*—The temple is situated some few yards within the Anamalai reserve boundary in the neighbourhood of survey field No. 904 of Dhalli village. Cooking will not be permitted here, or kindling of fire. This may be done, however, outside the reserve limits a few yards off. An extent of one acre round the temple will be set apart for the use of the pilgrims. Access to the temple will be by right of way No. I-10.

(5) *Tirumurthi temple and Panchalingam.*—The Tirumurthi temple is situated within the Anamalai reserve in the bed of the Palar river about two furlongs to the south side of survey field No. 325 of Dhalli village. Fires may be kindled and cooking performed at the temple subject to the restriction that no cooking is to be carried on except in the space provided for that purpose. Access to the temple will be by right of way No. I-11.

(6) *Panchalingam.*—This is situated in the Anamalai reserve about half a mile up the Palar river from Tirumurthi temple. No fire is to be kindled at the bathing place. An area of 50 acres round the Tirumurthi temple and Panchalingam will be set apart for use of the pilgrims. Access to the temple will be by right of way No. I-12.

(7) *Mamangathamman koil.*—This is situated about 1½ miles south of Tirumurthi temple within the Anamalai reserve. No fire shall be kindled or cooking performed at the temple itself. The people will, therefore, have to cook food at the place provided at Tirumurthi and carried thence to the temple. An extent of one acre round the temple will be set apart for use of the pilgrims. Access to the temple will be by right of way No. I-13.

(8) *Bodinayakam koil.*—The koil is situated within the Anamalai reserve about two miles south of survey field No. 344 of Jellipatti village. No fire may be kindled, nor cooking carried on in the neighbourhood of this koil, such latter must be done outside the reserve or in the space allotted for the purpose. An extent of one acre round the temple will be set apart for use of the pilgrims. Access to the koil will be by right of way No. I-14.

(9) *Yelumalayan Venkatachalapathi koil.*—The koil is situated about 2½ miles within the Anamalai reserve to the south side of survey field No. 453 of Manupatti village. An area of 100 acres round the temple will be set apart for use of the pilgrims. Thirty cattle are permitted free grazing. All cooking and lighting of fires for that or any other purpose is to be restricted to this area round the koil. Access to the koil will be by right of way No. I-15.

(10) *Mukundappar koil.*—This is situated within the Anamalai reserve near its south-west corner about four miles south of survey field No. 448 of Kallapuram village. An extent of one acre around the temple will be set apart for the use of pilgrims. Access to the koil will be by right of way No. I-18.

(11) *Avarakodipallam temple.*—There is a shrine in the Avarakodipallam addition. Right to worship at this temple and within a space of 25 yards square round it and a right of way thereto by a path to the fields already admitted at settlement has now been admitted.

(12) *Kamatchi Amman koil.*—Right to worship at this temple situated near the 17th mile stone on the Anamalai Ghat road. All acts incidental to the worship will be allowed within the area, viz., 0·12 acre. Access to the temple is by the Pollachi-Anamalai Ghat road.

(13) *Athaliamman koil.*—Right to worship at this koil situated about 440 yards north-east of the 1st mile stone on the Anamalai Ghat road. All acts incidental to the worship will be allowed within the two areas of 0·25 acre and 3·25 acres. The area of 0.25 acre is used by the pilgrims for cooking:—

Right of way for men only over the path described below leading to above temple is admitted.

The path branches off from the Anamalai Ghat road at one chain north-east of the 6th furlong of the 1st mile, and runs south-east for a distance of 1½ chains. Its width is 30 feet.

(14) *Kannimar Amman koil Right to worship at this temple situated on the left bank of the Pulliampatti Ar. at 8½ chains east of its junction with the Avarakodipallam stream.*—All acts incidental to the worship will be allowed within the area. The area of the plot of land is 0·4 acre and it is situated on the left bank of the Puliampatti Ar.

Right of way for men only over the path, described below, leading to the temple is admitted. The path branches off from the right of way No. 9, at a point about 26 chains south-west of cairn No. 617 and runs south-west for a distance of 8.04 chains to the Puliampatti Ar through the temple. Its width is 30 feet.

III

Right to collect minor forest produce in Anamalai Reserve admitted at the time of forest settlement.

1. Right to collect minor forest produce, such as gallnuts, deer horns, honey and wax within the Anamalai reserve during the months of Masi and Panguni (February and April) and Audi (July and August) claimed at the time of forest settlement by Rakkan, Mundayan and Kuppan and the other five Mulcer families living at Kombuparai, hamlet of Kallapuram village, Udumalpet taluk. The claim to right to collect the minor forest produce mentioned above is admitted provided always that all such produce collected by the claimants shall be sold to the District Forest Officer or his nominee for cash or bartered for goods.

2. Claim to continue to exercise the privilege in Anamalai reserve of gathering minor forest produce, such as honey, bees' wax, gallnuts and horns for barter with the forest contractor, they receiving from the latter grain, salt, tamarind and clothes (claimed at the time of forest settlement by Kabilappan, Muduvar living at the Kil Kurumalai and eight other Muduvars and twenty Pulayars, all of the same place, Udumalpet taluk). The claim is admitted to gather jungle produce for disposal to the Government forest contractor for barter alone and subject to the provisions of the paragraph 9 of G.O. No. 1612, Revenue, dated 2nd August 1879.

3. *Claim put in at the time of the forest settlement by Chinna Kali, headman of Pulayars at Punachi, Pollachi taluk, for the right to collect jungle produce among the Anamalai hills.*—The claim to the right to collect minor forest produce is admitted on behalf of the community of Pulayars at Punachi, a place in Anamalai jungle. The time of collection is whenever they wish. The right is subject to the following provisos; the produce must be disposed of to the forest contractor for barter. The recognition of this right does not bar or in any way interfere with the right of the Government, also to gather such produce in such manner as they may from time to time decide.

4. *Claim put in at the time of forest settlement by Ponoo, headman of the Kader tribe community, twenty in number, living in Punachi hill, for the right to collect minor forest produce in the Anamalai hills.*—The claim to right to collect minor forest produce is admitted. The time for collecting the produce is all the year round. The minor forest produce collected, such as horns, wax, honey and nuts is to be sold or bartered to the Government forest contractor. The admission of this right does not bar the right of Government to deal with the collection and disposal of minor forest produce hereafter as they may think fit.

5. *Claim for specific rights in the collection of minor forest produce vested in the hill tribes of the Anamalais, viz., Muduvars and Pulayars.*—All the hill tribes of the Anamalais, Pulayars, Mulcers, Muduvars and Kaders are hereby allowed to collect minor forest produce, such as honey, horns, wax and nuts, etc., throughout the year all over the Anamalais. All such produce is to be disposed of to the Government forest contractor for money or goods as may be desired. This permission does not bar the rights of Government to hereafter collect and dispose of the minor forest produce as may seem good to them.

IV

PRIVATE CHANNELS AND ANICUTS.

1. *Anicut No. 1 owned by Sellappa Kavandan.*—This is built across the Chinnar river in Anamalai reserve about 3·70 chains south of kairn No. 239 in Kottur village of Pollachi taluk. The anicut is 383 feet long, of which 300 feet is built of rough stone in cement and is of 4 feet 8 inches broad and 8 feet high. The remaining 83 feet is of boulder stones heaped up to a width of 3 feet and to a depth of 3 feet and earth being spread on the top and inside the stone work to prevent leaking.

2. *Channel No. 1 owned by Sellappa Kavandar.*—A channel starts from the above anicut on the left arm of the Chinnar river, runs through the Anamalai reserve in a northerly direction for about 3·70 chains and leaves the reserve at about cairn No. 239. It re-enters the reserve at above cairn No. 238, runs north-west through the said reserve by the side of the reserve boundary line as far as cairn No. 236 and eventually leaves the reserve at the last-named point at about the south corner of survey field No. 1479 of Kottur village, Pollachi taluk. The total length of this channel so far as it lies in the Anamalai reserve is about 13.70 chains.

3. *Branch channel.*—Another channel branches from the above private channel at about 1½ chains south of cairn No. 239, runs in a northerly direction and leaves the Anamalai reserve at about cairn No. 240 in the south side of survey field No. 1476 of Kottur village. The length of this channel so far as it lies in the Anamalai reserve is about 6 chains.

4. *Anicut No. 2 owned by Sellappa Kavandan.*—This is situated in Anamalai reserve, Kottur village, in Pollachi taluk. It is built across the same Chinnar river but still lower down. It is about 1½ chains to the south of cairn No. 241 and is 66 feet long, 9 feet broad and 3 feet high and consists of rough stone boulders, the interior spaces being filled with earth to prevent leakage.

5. *Channel No. 2 owned by Sellappa Kavandan.*—A small channel runs from the above anicut across the Chinnar river in the Anamalai reserve about 1½ chains to the south of cairn No. 241, runs in a northerly direction and leaves the reserve at cairn No. 241, in the south side of survey field No. 1476 of Kottur village, Pollachi taluk. The length of this channel so far as it lies in Anamalai reserve is about 2½ chains.

6. *Navamulai anicut and channel owned by Saiyid Hasan Sahib of Angalakurichi village.*—The channel starts from the eastern arm of the Aliar river in Anamalai reserve where an anicut has been built of rough stone across the river at a distance of 29.12 chains to the south-west of cairn No. 324 on the Anamalai reserve boundary line. The anicut is 5 chains long, 10 feet broad and 6 feet high. The channel runs from this anicut through the Anamalai reserve forest in a slightly north-easterly direction for a distance of 10·05 chains where it divides itself into two as upper and lower channels.

The upper channel runs through the reserve for a distance of 18.86 chains and leaves the reserve boundary line between cairns Nos. 324 and 325 at a point 330½ and 40 links from cairn No. 325. The lower one runs through the reserve from the point of bifurcation to the reserve boundary for a distance of 19.07 chains and leaves the reserve boundary line between cairn Nos. 323 and 324 at a point which is 180 links from cairn No. 324.

7. *Krishnier's right to maintain private channel constructed by him in Anamalai reserve—Description.*—A channel taking off from the Government anicut across the eastern arm of the Amaravathi river at Manthorai and running through the Anamalai reserved forest first in a north-westerly direction for 40 chains, thence north-east for 40 chains, thence northwards for 80 chains; thence east, almost following the northern boundary of the Anamalai reserve for a distance of 3 miles and leaving the reserve at the junction of the northern boundary of the said reserve with the southern side of field No. 448 (channel of Kallapuram village).

V

AREA DISAFFORESTED IN ANAMALAI RESERVE AND KNOWN AS THE ANAMALAI TOWNSHIP.

It is bounded on the north by the Stanmore Estate, on the east by the Puduthottam Estate, on the south by the Castlecroft and Sirukundru Estates and on the west by the Stanmore Anamalai Company's Estates.

N.B.—The Anamalai reserve includes within its limits the Punachi reserve.

Other Concessions.

I. Permission is granted to the Executive Engineer, Civil Engineering Division, Hydro-Electric Development Department, Madras, to enter into and occupy a plot of reserved forest measuring 4.25 acres in Anamalai reserve, Punachi range, for the purpose of building two lascars' quarters.

Conditions.

(1) Nobody occupying the lines will be allowed to have fire-arms.

(2) The land is not to be used for other purposes.

(3) The land will be handed back to the Forest Department if no longer required.

(4) The area will be neatly fenced to prevent extension of the land occupied by the lascars.

II. Licence for use of land and water granted to the Anamalai Ropeway Company in G.O. No. 1893, Revenue, dated 20th October 1933.

III. Permission has been granted by the Chief Conservator of Forests to the Resident Engineer, Hydro-Electric Department, Pykara Construction Works, to do all acts necessary for the maintenance of the hydro-electric power transmission and telephone line from Vannanthorai to Iyerpadi and of the branch telephone line from the main transmission and telephone line to the quarters constructed by the Hydro-Electric Department at Attakatti, wherever the line passes through the Anamalai reserved forest. The maximum width for clearing permitted is 50 feet on either side from the centre in the case of the main line and 10 feet on either side from the centre in the case of the branch telephone line. No right to any form of forest produce is conferred by this order, and where any tree growth is cut, the fact should be intimated to the District Forest Officer who will take charge of it and effect its disposal. (C.C.P. Mis. No. 446, dated 10th October 1933.)

(*b*) TUNACADAVU RESERVE INCLUDING TEKKADI LEASED FORESTS.

The following rights of way are admitted through the reserve:—

(1) *Right of way from Tunacadavu (Mount Stuart) to the Cochin territory via the Anaigundi pass.*—The path runs from Mount Stuart in a southerly direction via the Anaigundi pass and leaves the Coimbatore-Cochin boundary at about 1½ miles south-east of the Vengoli Malai (peak), distance of the path up to the district boundary being about 4 miles and width 30 feet.

NOTE.—The Nambidis and Government Kadirs have sole right of way over the path.

(2) *Right of way from Tellikal to Pillakalparai in Tekkadi leased forests.*—The path runs from Tellikal in a south-easterly direction as far as Pillakalparai, crossing the Tunacadavu river *en route*. Distance of the path is about 2½ miles and width 30 feet.

NOTE.—The Nambidis and Government Kadirs have sole right of way over the path.

(3) *Right of way from Tellikal to Tekkadi and thence to Gudaravalli forest in Coimbatore district.*—This route consists of four sections, viz.:—

(*a*) Route from Tellikal to Kachithod in the Kollengode Raja's forest which is only a footpath. Distance of that portion of this section lying within the Tekkadi leased forest is about 2 miles.

(*b*) In continuation of the above path the route from Kachithod to Pazhayamudi is a cart-track. It runs in a north-easterly direction along Kaliyanakodal, Puvankadavu, Mangiyam and Pulialandanparai and Pazhayamudi as shown in the map. Distance of the portion of the cart-track lying within the Tekkadi leased forests is about 4 miles.

(*c*) The route from Pazhayamudi to Adivaram is a timber slide as shown in the map. Distance of the slide is about 2 furlongs.

(*d*) From the bottom of the slip a cart-track runs from Adivaram in a south-easterly direction for about 2 miles within the leased forest and leaving the Tekkadi leased forests at about 24 chains slightly north-east of Pandaravarai Malai, 4236, it runs through Gudaravalli forests in British territory in an easterly direction as far as the reserve boundary at about 1½ chains to the north of the south-west corner of

S. No. 931 of Vettaikaranpudur village, Pollachi taluk. Distance of the cart-track from the district boundary to the reserve boundary is about 3 miles. Width of the whole right of way is 30 feet.

NOTE.—The lessors of Tekkadi leased forests, their legal representatives and assigns and their agents, contractors and servants, are permitted the full and free use of the existing road or track leading from Tellikal to Tekkadi and thence through Pazhayamudi to the Government reserve forest in the Coimbatore district known as Gudaravarai and also of the existing timber slip adjoining the said road from Pazhayamudi to Gudaravarai adivaram, the portion of the said road and a slip over which the lessors, their legal representatives and assigns and their agents, contractors and servants, shall have and exercise such right of way, being marked on the plan attached with the lease deed with the letters X, X, X and Y, Y, Y, respectively. The use of the existing foot-path for men and cattle will also be permitted between Mangiyanur (which lies about three-fourths of a mile or a mile south south-east of Tekkadi) and Kaliyanakudal, subject always, as regards all rights of way and use of such road, timber slip and foot-path as aforesaid and the use of the depots referred to in (II) (3) below, to the necessary restrictions with regard to the keeping, carrying and kindling of fire provided for in the Madras Forest Act.

MISCELLANEOUS RIGHTS.

(1) *As regards the right to collect the minor produce in British portion of the Tunacadavu reserve.*—No claims to collect or share in the value of the minor forest produce from the Government reserve were advanced at the time of settlement except by the Kadirs whose privileges in this respect are not gainsaid and are fully recognized by Government.

(2) The lessors of the Tekkadi leased forests, their legal representatives and assigns and their agents, contractors and servants shall be permitted to import forest produce across the Tekkadi river and the Anaikadavu stream at the five several points shown in the said plan annexed to the lease deed and marked with the letters A, B, C, D and E, such forest produce to be taken from such points to the nearest point on the road mentioned in note to right of way No. I (3) above, provided always that such permission shall only extend to such forest produce as shall be stamped with the stamp of the lessors, their legal representatives or assigns and accompanied by a pass or permit identifying such forest produce both by number or pieces and by the marks thereon. Such pass or permit to be signed by the lessors, their legal representatives or assigns or by some duly authorized agent and provided always that, in the case of bamboos, firewood and minor produce which cannot be stamped, it will be sufficient if it is accompanied by a pass or permit identifying it by number or quantity issued, and signed as above provided.

(3) The lessors of Tekkadi leased forests, their legal representatives and assigns and their agents, contractors and servants shall be permitted to store in the customary manner all such timber so stamped and accompanied by a pass or permit as provided for above, at the top and bottom, respectively, of the timber slip adjoining the road from Pazhayamudi to Gudaravarai Adivaram referred to above and at no other place.

(4) That the Government shall deliver to the lessors of the Tekkadi leased forests, their legal representatives and assigns all elephants captured accidentally or ivory found by it upon the leased forest upon payment of all expenses in connexion therewith including therein the payment of the usual reward to the finder of such ivory or, at the option of the Government, its successors or assigns will pay the lessors, their legal representatives or assigns the fair market value of the same after deducting therefrom all such expenses as aforesaid, provided that the Government shall take no steps to capture such elephants by digging pits or covering in those already dug or otherwise.

(5) That the Government, its successors or assigns shall not, in Tekkadi leased forests, quarry or mine for metals or precious stones but shall be at liberty to quarry for and use all stones, gravel or earth in, or under the said demised premises.

(6) The lessors of Tekkadi leased forests, their legal representatives and assigns and their agents, servants and workmen shall not during the term of lease enter upon any part of the leased forests for the purpose of prospecting or mining for minerals or precious stones, capturing elephants, removing ivory or for any other purpose whatsoever save for the purpose of exercising the rights of way user and re-entry reserved to the lessors by clauses mentioned above, without the special permission in writing of the Government, its successors or assigns.

(c) KUDRAIYAR RESERVED FOREST.

The following rights of way through the reserve are admitted. They are 10 yards wide and open for men and cattle.

(1) *Kukkal to Kavalapatti.*—It enters the reserve from the south 15 chains west of the Kudraiyar river and runs generally in a north-easterly direction along the left bank of the Kudraiyar river touching the easternmost corner of S. No. 227 and passing through S. No. 228 of Kukkal village and leaves the reserve at the junction of Mullolodai with the Kudraiyar river.

(2) *Puttur to Kavalapatti via Athivayal.*—It enters the reserve 41 chains east of Chinnavarai and runs in a north-easterly direction in a zigzag way passing through S. No. 293 of Kukkal village and leaves the reserve at a point 80 chains west of the junction of the northern boundaries of the Kudraiyar and Oliyanuthu reserves.

(3) *Puttur to Kavalapatti.*—It enters the eastern boundary of the reserve 28 chains north of the south-east corner of Kudraiyar reserve and runs in a northerly direction along the common boundary of the Oliyanuthu and Kudraiyar reserves and leads to the plains at the junction of the northern boundaries of the Kudraiyar and Oliyanuthu reserves.

Specification of patta lands admitted.					
Portions of reserve to be disafforested.	District.	Taluk.	Village.	Area. ACS.	Boundaries.
Survey No. 227 of Kudraiyar reserve.	Madura ..	Kodaikanal ..	Kukkal ..	1·23	Bounded on all sides by reserved forests.
Survey No. 228-A to J of Kudraiyar reserve.	Do. ..	Do. ..	Do. ..	7·77	*North.*—Reserved forests. *East.*—Reserved forests. *South.*—Survey No. 228-K. *West*—Survey No. 228-K and reserved forest.
Survey No. 294-A, B and D to F of Kudraiyar reserve.	Do. ..	Do. ..	Do. ..	5·18	Bounded on all sides by reserved forest.
			Total ..	14·18	

Brief description.—These fields are under cultivation by pattadars.

(*d*) MANJAMPATTI RESERVED FOREST.

The undermentioned rights of way are allowed within the block:—

(1) Foot-path from Manavanur to Manjampatti, 6 feet wide and open for people and cattle. It enters the block near cairn No. I and running north-westwards along the boundary leaves it at Kuttuar.

(2) Foot-path from Manjampatti to Anchinad, 3 feet wide and open for people. It enters the block near the point where the path to Tallanchi branches from it and runs westwards through the block for about 12 chains.

(3) Foot-path from Manjampatti to Kareappanshola, three feet wide and open for people. It enters the block west-south-west of the village-site of Manjampatti and runs west-south-westwards through the block for about 32 chains.

(*e*) AMARAVATHI RESERVED FOREST.

Kattilapparamman koil.—Right to worship at this koil situated on the left bank of the Chinnar river at a distance of 1 mile 3 furlongs and 1.29 chains up the river from the bridge by which the Udumalpet-Munnar road crosses Chinnar river. All acts incidental to worship will be allowed within the plot, the area of which is 2·50 acres. Access to it is allowed by a path which leaves the Udumalpet-Munnar road at a point 4.74 chains north of the northern edge of the Chinnar bridge, runs generally west almost parallel to the left bank of the Chinnar river for a distance of 1 mile 3 furlongs and 1.29 chains and enters the temple area on its east side at a point 50 links north of its south-east corner.

The path is open to the general public and is 30 feet wide throughout.

(Chief Conservator's Proceedings Mis. No. 320, dated 14th July 1932.)

APPENDIX B.

Table showing top height against All-India quality and age for plantation teak.

Age in years.	Top height in feet.				
	Site Quality I.	Site Quality II.	Site Quality III.	Site Quality IV.	Site Quality V.
5	51 47 43	43 40 37	37 33 30	30 27 23	23 20 17
10	73 68 63	63 58 53	53 49 44	44 39 34	34 29 24
15	87 80 75	75 69 64	64 58 52	52 46 40	40 35 29
20	96 90 83	83 77 70	70 64 58	58 51 45	45 38 32
25	104 97 90	90 83 76	76 69 62	62 55 48	48 42 35
30	110 103 96	96 88 81	81 73 66	66 59 51	51 44 37
35	116 108 101	101 93 85	85 77 70	70 62 54	54 46 39
40	121 113 105	105 97 89	89 81 73	73 64 56	56 48 40
45	126 118 109	109 101 92	92 84 75	75 67 58	58 50 42
50	130 121 113	113 104 95	95 87 78	78 69 60	60 52 43
55	134 125 116	116 107 98	98 89 80	80 71 62	62 53 45
60	137 128 119	119 110 101	101 91 82	82 73 64	64 55 46
65	141 131 122	122 112 103	103 94 85	85 75 66	66 56 47
70	144 134 125	125 115 106	106 96 86	86 77 67	67 58 48
75	147 137 128	128 118 108	108 98 88	88 78 69	69 59 49
80	150 140 130	130 120 110	110 100 90	90 80 70	70 60 50

Note.—The middle figures refer to mean values.

Table showing the number of stems per acre and the approximate espacement in the main crop (after thinning) for a given top height.

Top height in feet.	Number of stems per acre. after thinning.	Approximate espacement in feet.	Top height in feet.	Number of stems per acre. after thinning.	Approximate espacement in feet.
30	560	9 × 9	70	105	20 × 20
35	465	10 × 10	75	85	23 × 23
40	385	11 × 11	80	70	27 × 27
45	315	12 × 12	85	60	28 × 28
50	260	13 × 13	90	52	30 × 30
55	210	15 × 15	100	40	33 × 33
60	165	16 × 16	110	33	36 × 36
65	130	18 × 18			

APPENDIX C.

List of headings for Control Journal.

1. General— (*a*) Conversion Working Circle .. .. (*b*) Deciduous Selection Working Circle. (*c*) Evergreen Selection Working Circle. (*d*) Fuel Working Circle .. .. .. (*e*) Bamboo Working Circle .. .. (*f*) Minor Forest produce Working Circle. (*g*) Grazing Working Circle .. .. (*h*) Miscellaneous	Brief notes, in narrative form, of the position at the close of each year referring to arrears, deviation, amendments to working plan, reservation, disreservation, etc. Short notes amplifying entries in control forms and record of works will be useful.
2. Regeneration—	
(*a*) Natural regeneration	Observation on important species.
(*b*) Seed	Seed years, method of collection and storage, seasons, quantities, sources, pre-treatment.
(*c*) Nursery	General comments.
(*d*) Selection of areas for planting various species.	Do.
(*e*) Clear felling and burning	Do.
(*f*) Planting and sowing methods ..	Do.
(*g*) Notes on ponam regeneration ..	Kind of field crops and their influence on seedlings, obligations of ponamdars, etc.
3. Weeding, cleaning, soil aeration	Methods and general comments.
4. Climber cutting	Do.
5. Thinning	Mechanical thinnings and how they work, applicability of all India tables, etc.
6. Transport	Rates, seasons, routes, motor, lorries, etc.
7. Market conditions	....
8. Sale prices	....
9. Minor produce	Changes called for in sale methods. Special demand—General.
10. Roads	General—Costs—Suggestion.
11. Buildings	Do.
12. Boundaries	Maintenance—Cost—Check.
13. Injuries—	
(*a*) Fire	Areas burnt and causes—Changes in fire protection methods.
(*b*) Offences	Summary of offences, general.
(*c*) Concessions	Use and abuse.
(*d*) Climbers, lantana, bamboos	....
(*e*) Insects	....
(*f*) Others	....

14. Grazing and fodder grass	Notes on trend on grazing—Revenue—Areas closed—Incidence by reserves.
15. Elephant capturing	....
16. Rainfall and climate	....
17. Staff	....
18. Labour	....
19. Hill tribes	....
20. Contractors	Names, standing, reliability, good and bad work.
21. Camps	....
22. Shooting and fishing	Preservation of game.
23. Inspection notes	Complete file to be maintained.
24. Malarial prophylaxis	Work done and results.
25. Miscellaneous	....
26. Financial results	.....

APPENDIX D.

(i) *List of flora.*

Botanical name.	Tamil name.
Abrus precatorius	Kundumani.
Acacia arabica	Karuvelam.
Acacia concinna	Seekai.
Acacia ferruginea	Parambai.
Acacia intsia	Kar-indu.
Acacia latronum	Odai.
Acacia leucophloea	Velvelam.
Acacia pennata	Vella-indu.
Acalypha fruticosa	Senni.
Acrocarpus fraxinifolius	Mala-konnai.
Acronychia laurifolia	Kattu-kanni.
Actinodaphne hirsuta	..
Actinodaphne hookeri	Thali.
Adenochlaena indica	..
Adina cordifolia	Manjakadambai.
Aglaia roxburghiana	Chokala.
Aglaia travancorica	..
Agrostistachys indica	Mancharei.
Ailanthus excelsa	Periyamaram or Pee-maram.
Ailanthus malabarica	Mattipal.
Albizzia amara	Unjal.
Albizzia lebbek	Vagai.
Albizzia Odaratissima	Selavagai.
Albizzia procera	Velvagai.
Albizzia stipulata	Pulivagai.
Allophylus cobbe	Amalai.
Alsodeia zeylanica	..
Alstonia scholaris	Elelaipalai.
Amoora canarana	Kar-agil.
Amoora rohituka	Vangal.
Amrido dorax	Nanal-pillu.
Anogeissus latifolia	Vekkali.
Anthocephalus cadamba	Vellai-kadambu.
Antiaris toxicaria	Alli, Aranthalli.
Antidesma menasu	Nirilai.
Aphania bifoliolata	Semblichi.
Aporosa lindleyana	Vittil.
Arenga wightii	Alampanei.
Aristolachia roxburghiana.	..
Artocarpus hirsuta	Anjili (Aynipila).
Artocarpus integrifolia	Pila.
Artocarpus lakoocha	Irappila.
Asparagus racemosus	Kattu-avarai, catavari.
Atalantia monophylla	Kattu-elumichum.
Azadirachta indica	Veppam.
Balsamodendron berryi	Mul-kiluvai.
Bambusa arundinacea	Moongil (Peruvarai).
Bassia latifolia	Iluppa.
Bauhinia malabarica	Malayathi.
Bauhinia phoenicea	..
Bauhinia racemosa	Aathi.
Beilschmiedia bourdilloni	..
Beilschmiedia wightii	..
Bischofia javanica	Cholavengai.
Bombax insigne	Seema-poolai.
Bombax malabaricum	Ilavu (poola).
Bridelia retusa	Mul-vengai.
Buchanania latifolia	Sarai, morala.
Butea frondosa	Ela-porasu.
Calamus pseudotenuis	Chinna-perambu.
Calamus rheedili	Kattu-perambu.
Calamus travancoricus	Man-perambu.
Calophyllum elatum	Sri-konnai.
Calophyllum tomentosum	Do.
Calotropis gigantea	Erukku.
Capparis grandiflora	Thorattimul.
Canarium strictum	Kundurikam, Kungiliyam.
Canthium didymum	Sulunthu.
Canthium parviflorum	Nalla-karai.
Carallia lucida	Varanga.
Careya arborea	Ayama.
Cartalaria juncea	Manjee.
Carissa carandas	Kalakkai.
Casearia esculenta	Kakkaipilai.
Casearia tomentosa	Kutti.
Cassia auriculata	Avaram.
Cassia fistula	Konnai.
Cassia montana	Konnu-avaram.
Cedrela serrata	..
Cedrela toona	Chuganagil.
Chukrasia tabularis	Agil.
Chloroxylon swictenia	Porasu.
Chomelia asiatica	Therani.
Chrysophyllum roxburghii.	Kattu-iluppa.
Cinnamomum sulphuratum.	..
Cinnamomum wightii	Lavangam.
Cinnamomum zeylanicum.	Karuva.
Cipadessa fruticosa	Sannathur-ukkavembu.
Clausena willenowii	Kattu-veppilai.
Clerodederon infortunatum.	Perugilai.
Cleistanthus collinus	Odda-maram.
Cochlospermum gossypium.	Thanakku.
Cocos nucifera	Thennaimaram.
Cordia fulvosa	Narivirium.
Cordia myxa	Virusham.
Cordia wallachii.	..
Crataeva religiosa	Mavalingam.
Croton malabaricus	Tavattu-polavu.
Cryptocarya arygdalina.	..
Cullenia excelsa	Vedi-pila.
Curcuma spp	Kattu-kuvai.
Curcuma longa	Manjal.
Cyclostemon macrophyllus.	..
Cyperus pangarai	Korai pillu.
Dalbergia latifolia	Ettai.
Dalbergia paniculata	Pachali.
Dalbergia sissoides	Do.
Daphniphyllum glaucescens.	Soluvam.
Dendrocalamus brandisii	Moongil.

Botanical name.	Tamil name.
Dendrocalamus longispathus.	Moongil.
Dendrocalamus strictus ..	Kal-moongil
Derris scandens ..	Punali-kodi.
Desmodium pulchellum. ..	..
Dichopsis elliptica ..	Pali.
Dichrostachys cinerea ..	Vedathala.
Dillenia pentagyna ..	Punnai.
Dimorphocalyx lawianus ..	..
Diospyros affinis ..	Vakkanai.
Diospyros bourdilloni ..	Karunduvarai.
Diospyros microphylla ..	Chinna-thuvarai.
Diospyros montana ..	Vakkanai.
Dodonaea viscosa ..	Virali.
Dolichandrone falcata ..	Kalar-athi.
Dysoxylum malabaricum ..	Vell-agil.
Dysoxylum purpureum ..	Kar-agil.
Elaeocarpus ferrugineus. ..	..
Elaeocarpus munroii ..	Kal-bikki.
Elaeocarpus oblongus ..	Kattu-karai.
Elaeocarpus serratus ..	Karai.
Elaeocarpus tuberculatus ..	Ruthraksham.
Elaeodendron glaucum ..	Karu-kuva, Cilupa.
Elettaria cardamomum ..	Elam.
Entada scandens ..	Irikki.
Eriodendron anfractuosum.	Seema-poola.
Erythrina spp. ..	..
Erythroxylon monogynum.	Chembulichan.
Eugenia argentea ..	Naval.
Eugenia gardneri ..	Do.
Eugenia hemisphaerica ..	Vellai-naval.
Eugenia jambolana ..	Naval.
Eugenia laeta. ..	..
Eugenia malabarica. ..	..
Eugenia munronii ..	Aiva.
Eugenia wynadensis. ..	..
Eugenia zeylanica. ..	..
Euphorbia antiquorum ..	Thirukalli.
Euphorbia tirucalli ..	Do.
Evodia roxburghiana. ..	..
Excoecaria robusta. ..	..
Feronia elephantum ..	Vilamaram.
Ficus bengalensis ..	Alamaram.
Ficus Callosa ..	Koli-al.
Ficus gibbosa ..	Athi.
Ficus glomerata ..	Ichi-maram.
Ficus hispida ..	Chona-athi.
Ficus retusa ..	Kolichi.
Ficus tomentosa ..	Kal-athi.
Ficus tsiela ..	Ichi.
Filicium dicipiens ..	Ningal.
Flacourtia sepiaria ..	Cottaikala.
Flueggia leucopyrus ..	Veppoola.
Flueggia microcarpa ..	Poola.
Garcinia cambogia ..	Kodukkappuli.
Garcinia xanthochymus ..	Malaippuli.
Gardenia gummifera ..	Kambali-pisin.
Gardenia echinocarpa ..	..
Gardenia morella ..	Makki.
Garuga pinnata ..	Karuvembu.
Givotia rottleriformis ..	Boothali.
Glochidion malabaricum ..	..
Glochidion rigidum ..	..
Glycosmis pentaphylla ..	Kulapane.
Gmelina arborea ..	Kumil.
Gmelina asiatica ..	Kumulam chedi.
Gnetum scandens ..	..
Gomphandra polymorpha ..	..
Goniothalamus cardiopetalus.	..
Gordonia obtusa ..	Miyilai.
Grewia asiatica ..	Unnu.
Grewia laevigata ..	Naraittai.
Grewia orientalis ..	Unnu.
Grewia tiliaefolia ..	Thadasu.
Gymnema montanum ..	Mahali.
Gyrocarpus americanus ..	Vella-thanakku.
Gyrocarpus jacquini ..	Do.
Hardwickia binata ..	Acha.
Hardwickia pinnata ..	Madayan-samprani.
Harpulia imbricata ..	..
Helicteres isora ..	Kaiva, valamburi.
Hemicyclia elata ..	Vellelumbu.
Hemicyclia sepiaria ..	Veeran.
Heptapleurum stellatum ..	..
Heritiera papilio ..	Chatanangu.
Heynea trijuga ..	Cendarai.
Hiptage madablota ..	Venvelankodi.
Holigarna arnottiana ..	Kattucheru.
Holigarna grahamii. ..	..
Homalium zeylanicum ..	Kattucheru.
Hopea parviflora ..	Erumbagam, Irumbagam.
Hugonia mystax ..	Modirakanni.
Hydnocarpus wightiana ..	Maravetti.
Hymenodictyon excelsum ..	Malai-thanakku.
Ilex spp ..	..
Ixora parviflora ..	Kora
Jatropha curcas ..	Kattamanaku.
Kurrimia indica ..	..
Lagerstroemia flosreginae ..	Pumaruthu.
Lagerstroemia lanceolata ..	Venteak.
Lansium anamalayanum ..	Santhana viri.
Lantana camara ..	Arippu.
Laportia crenulata ..	Anachorian (Ottapilavu)
Leea sambucina. ..	..
Limonia acidissima ..	Narivela, Naivela.
Linociera malabarica ..	Porambalu.
Litsaea stocksii ..	..
Litsaea wightiana ..	..
Loranthus ..	Ethukanni.
Macaranga peltata ..	Vatta.
Macaranga roxburghii ..	Do.
Machilus macrantha ..	Kolamavu.
Maesa indica ..	Bamavai.
Mallotus philippinensis ..	Kapila.
Mangifera indica ..	Mamaram.
Mappia foetida ..	Arali.
Mastixia arborea ..	..
Melastoma malabathricum.	Kadalai.
Melia dubia ..	Mala-vembu.
Meliosma arnottiana ..	Hulimakay.
Meliosma simplicifolia ..	Cembavu.
Memecylon edule ..	Kasan, Kayan.
Memecylon malabaricum ..	Perungaca.
Mesua ferrea ..	Suruli, Nangil.
Mimusops elangi ..	Elenji.
Mimusops hexandra ..	Karumpalai.
Morinda citrifolia ..	Noona.
Moringa pterygosperma ..	Kattu-murungai.
Mundulea suberosa ..	Karu-averai, Pillavarai.
Murraya koenigii ..	Karu-veppilai.
Musaparad sisera ..	Vazhai, valai.
Mussaenda frondosa ..	..
Myristica attenuata ..	Chorapanu.
Myristica canarica ..	Undippanu.
Myristica laurifolia ..	Jathica.
Myristica malabarica ..	Kattu-jathika.
Nephelium longaana ..	Kattu-poovam, Chempoovam.
Nothopegia colebrookiana ..	Sorapalai.
Ochlandra beddomei ..	Eta.
Ochlandra rheedii ..	..
Ochlandra travancorica ..	Ita-kalli.
Odina wodier ..	Udi, Uthi, Uthian, Kakausil.
Olea dioica ..	Kolipayar.
Opuntia dillenii ..	Sappathukalli.
Orophea zeylanica ..	..
Ostodes zeylanica ..	..
Pajanelia rheedii ..	Acci.
Pandanus furcatus ..	..
Paramignya armata ..	..
Pavetta hispidula ..	Pavetta.
Photinia notoniana ..	..
Phyllanthus emblica ..	Nellikai.
Pinanga dicksonii ..	Kanakamukku.
Piper nigrum ..	Milaku.
Pithecolobium anamalayanum.	..
Plumeria acutifolia ..	Alai.
Poeciloneuron indicum ..	Vazala.
Polyalthia cerasoides ..	Nedunar.
Polyalthia coffeoides ..	Nakuloi.
Polyalthia fragrans ..	Nedunar.
Premna integrifolia ..	Minnai.
Premna tomentosa ..	Kolakkattai thekku.
Prosopis indicus ..	..
Protium caudatum ..	Kiluvai.
Pterocarpus marsupium ..	Vengai.
Pterolobium indicum ..	Sigappu-indu, Kokkimullu.
Pterospermum heyneanum.	Polavu.
Pterospermum rubiginosum.	Chinna-polavu.
Putranjiva roxburghii ..	Karuppilai.
Pygeum wightianum ..	Attanari-kongu.
Randia dumetorum ..	Malukkarai.

Botanical name.	Tamil name.
Randia malabaricum	Sirukarai.
Sapindus emarginatus	Poochakottai.
Sapindus laurifolius	Manipungu.
Sapindus trifoliatus	Poochakottai.
Sarcococca pruniformis	..
Schleichera trijuga	Poovam.
Scolopia crenata	Terunaai.
Semecarpus anacardium	Serankottai.
Solanum pubescens	Sundakkai.
Spatholobus purpureus	..
Spondias mangifera	Kalimpalam.
Stephegyne parvifolia	Nirkadambai.
Stephegyne tubulosa	..
Sterculia alata	Anaithondi.
Sterculia colorata	Malamparuthi.
Sterculia foetida	Pinari.
Sterculia guttata	Kawili, Thondi.
Sterculia Villosa	Murutthan.
Stereospermum Chelonoides.	Poopathiri.
Stereospermum suaveolens	..
Stereospermum xylocarpum	Pathiri.
Strobilanthes barbatus	Kurinji.
Strobilanthes perfoliatus	Do.
Strychnos nux-vomica	Yetti.
Strychnos potatorum	Thettan kottai.
Swietenia macrophylla	..
Symplocos spicata	..
Tamarindus indica	Puliyamaram.
Tectona grandis	Tekku.
Terminalia arjuna	Mathi, Kola marudu.
Terminalia belerica	Thani.
Terminalia chebula	Kadukkai.
Terminalia crenulata	..
Terminalia paniculata	Vellamarudu, Pillamarudu.
Terminalia tomentosa	Karimarudu.
Tetrameles nudiflora	Chini.
Thespesia populnea	Poovarasu.
Thunbergia mysorensis	..
Toddalia bilocularis	..
Trema orientalis	Anaparuthi.
Trewia nudiflora	Naykumil.
Vateria indica	Vellakuntrikam.
Vatica roxburghiana	Tubam.
Ventilago madraspatana	Vembadum.
Vernonia arborea	Karandai.
Vitex altissima	Mailadi.
Vitis quadrangularis	Parandai.
Walsura piscidia	Valsura.
Webera corymbosa	Papatan.
Wendlandia notomiana	Thevarai.
Wrightia tinctoria	Palai.
Xylia xylocarpa	Irool.
Zanthoxylum rhetsa	Kattu-murukku.
Zinziber officinale	Inji.
Zizyphus jujuba	Yelandai.
Zizyphus oenoplia	Surai.
Zizyphus xylocarpa	Mulkottai.
Zizyphus xylopyrs	Kottai.

(ii) *List of flora.*

Tamil name.	Botanical name.
Acci	*Pajanelia rheedii.*
Acha	*Hardwickia binata.*
Agil	*Chukrasia tabularis.*
Alai	*Plumeria acutifolia.*
Alamaram	*Ficus bengalensis.*
Alampanei	*Arenga wightii.*
Alangi	*Elaeocarpus serratus.*
Amalai	*Allophylus cobbe.*
Anachoriyan	*Laportia crenulata.*
Anaparuthi	*Trema orientalis.*
Aneithondi	*Sterculia alata.*
Anjili (Aiyinipila)	*Artocarpus hirsuta.*
Arali	*Mappia foetida.*
Aranthalli (Alli)	*Antiaris toxicaria.*
Arippu	*Lantana camara.*
Athi	*Bauhinia racemosa.*
Atti	*Ficus gibbosa.*
Attanari kongu	*Pygeum wightianum.*
Avaram	*Cassia auriculata.*
Ayama	*Careya arborea.*
Bamarai	*Maesa indica.*
Boothali	*Givotia rottleriformis.*
Chatanangu	*Heritiera papilio.*
Cendrai	*Heyenea trijuga.*
Cembavu	*Meliosma simplicifolia.*
Chembulichan	*Erythroxylon monogynum.*
Chini	*Tetrameles nudiflora.*
Chinna polavu	*Pterospermum rubiginosum.*
Chinnathovarai	*Diospyros microphylla.*
Chinna perambu	*Calamus pseudotenuis.*
Chokala	*Aglaia roxburghiana.*
Cholavenga	*Bischofia javanica.*
Chona athi	*Ficus hispida.*
Chorapanu	*Myristica attenuata.*
Chukannakil	*Cedrela toona.*
Cottaikala	*Flacourtia sepiaria.*
Eatti	*Dalbergia latifolia.*
Elalaipalai	*Alastonia scholaris.*
Elam	*Elattaria cardamomum.*
Elaporasu	*Butea frondosa.*
Elengi	*Mimusops elengi.*
Errukkali	*Calotropis gigantea.*
Erumpakam (Irumpagam)	*Hopea parviflora.*
Eta	*Ochlandra beddomei.*
Ethukanni	*Loranthus.*
Hulimakay	*Meliosma arnottiana.*
Ichi	*Ficus tsiela.*
Ichimaram	*Ficus glomerata.*
Ilavu (Poola)	*Bombax malabaricum.*
Iluppa	*Bassia latifolia.*
Inji	*Zinziber officinale.*
Irappila	*Artocarpus lakoocha.*
Irikki	*Entada scandens.*
Irool	*Xylia xylocarpa.*
Itakalli	*Ochlandra travancorica.*
Jathika	*Myristica laurifolia.*
Kadalai	*Melastoma malabathricum.*
Kadukkai	*Termalia chebula.*
Kaiva (Valamburi)	*Helicteres isora.*
Kakkaippilai	*Casearia esculenta.*
Kalarathi	*Dolichandrone falcata.*
Kalbikki	*Elaeocarpus munroii.*
Kalimpalam	*Spondias mangifera.*
Kalmoongil	*Dendrocalamus strictus.*
Kalathi	*Ficus tomentosa.*
Kambalipisin	*Gardenia gummifera.*
Kanakamukku	*Pinanga dicksonii.*
Kapila	*Mallotus philippinensis.*
Karagil	*Amoora canarana.*
Karandai	*Vernonia arborea.*
Karei (Nagaram, Alangi).	*Elaeocarpus serratus.*
Karimarudu	*Terminalia tomentosa.*
Karindu	*Acacia intsia.*
Karu avarai (Kannu avarai).	*Mundulea suberosa.*
Karukuva	*Elaeodendron glaucum.*
Karuppilai	*Putranjiva roxburghii.*
Karunduvarai	*Diospyros bourdilloni.*
Karupalai (irkote)	*Mimusops hexandra.*
Karuva	*Cinnamomum zeylanicum.*
Karuvelam	*Acacia arabica.*
Karuvembu	*Garuga pinnata.*
Karuveppilai	*Murraya koenigii.*
Kassan (Kayan)	*Memecylon.*
Katampalam (Kalimpalam).	*Spondias mangifera.*
Katelumicham	*Atalantia monophylla.*
Kattujathika	*Myristica malabarica.*
Katveppilai	*Clausena Willdenowii.*
Katta karei	*Elaeocarpus oblongus.*
Kattamanak	*Jatropha curcas.*
Kattarasu (Kalathi)	*Ficus tomentosa.*
Kattiluppa	*Chrysophyllum roxburghii.*
Kattu avarai (Catavari).	*Asparagus racemosus.*
Kattu cheru	*Holigarna arnottiana.*
Kattu kanni	*Acronychia laurifolia.*
Kattu kuvai	*Curcuma spp.*
Kattu muringa	*Moringa pterygosperma.*
Kattu murukku	*Zanthoxylum rhetsa.*
Kattu perambu	*Calamus rheedii.*
Kattu poovam (Shenpuram).	*Nephelium longana.*

Tamil name.	Botanical name.
Kawili (Thondi)	*Stereulia guttata.*
Kalakkai	*Carissa carandas.*
Kiluvai	*Protium caudatum.*
Kodukapuli	*Garcinia cambogia.*
Kolakattai tekku	*Premna tomentosa.*
Kolamavu	*Michilus macrantha.*
Kolial	*Ficus callosa.*
Kolichi	*Ficus retusa.*
Kolipayar	*Olea dioica.*
Konnai	*Cassia fistula.*
Konnu avaram	*Cassia montana.*
Kora	*Ixora parviflora.*
Korai pillu	*Cyperus pangarai.*
Kottai	*Zizyphus zylopyrus.*
Kulapanei	*Glycosmis pentaphylla.*
Kumil	*Gmelina arborea.*
Kumulam chedi	*Gmelina asiatica.*
Kundrikam (Kungiliyam).	*Canarium strictum.*
Kundu mani	*Abrus precatorius.*
Kurinji	*Strobilanthes barbatus.*
Kutti	*Casearia tomentosa.*
Lavangam	*Cinnamomum wightii.*
Madayan samprani	*Hardwickia pinnata.*
Mahali	*Gymnema montanum.*
Mailadi	*Vitex altissima.*
Makki	*Gardenia morella.*
Malakonnai	*Acrocarpus fraxinifolius.*
Malai puli	*Garcinia zanthochymus.*
Malam paruthi	*Sterculia colorata.*
Mala Thanakku	*Hymenodictyon excelsum.*
Mala vembu	*Melia dubia.*
Malukkarai	*Randia dumetorum.*
Mamaram	*Mangifera indica.*
Man charei	*Agrostistachys indica.*
Manipunga	*Sapindus laurifolius.*
Manjakadambai	*Adina cordifolia.*
Manjal	*Curcuma longa.*
Manjee	*Cartalaria juncea.*
Man perambu	*Calamus travancoricus.*
Mara vetti	*Hydnocarpus wightiana.*
Marauri	*Antiaris toxicaria.*
Mathi (Kolamarudu)	*Terminalia arjuna.*
Mattipal	*Ailanthus malabarica.*
Mavalingam	*Crataeva religiosa.*
Milaku	*Piper nigrum.*
Minnai	*Premna integrifolia.*
Miyilai	*Gardonia obtusa.*
Modirakkani	*Hugonia mystax.*
Moongil	*Bambusa arundinacea.*
Mulkiluvai	*Balsamodendron berryi.*
Mulkottai	*Zizyphus xylocarpa.*
Mulvengai	*Bridelia retusa.*
Muruthan	*Sterculia villosa.*
Nagaramaram	*Elaeocarpus serratus.*
Nakuloi	*Polyalthia coffeoides.*
Nalla karai	*Canthium parviflorum.*
Nanal pillu	*Amrido dorax.*
Nangil (Suruli)	*Mesua ferrea.*
Naraittai	*Grewia lavigata.*
Narivela (Naivela)	*Limonia acidissima.*
Narivirium	*Cordia fulvosa.*
Naval	*Euginia spp.*
Nayikumil	*Trewia nudiflora.*
Nedunar	*Polyalthia cerasoides.*
Nellikkai	*Phyllanthus emblica.*
Nirilai	*Antedesma menasu.*
Ningal	*Filicium dicipiens.*
Nirkadamba	*Stephegyne parvifolia.*
Noona	*Morinda citrifolia.*
Odai	*Acacia latronum.*
Oddamaram	*Cleistanthus collinus.*
Pachali	*Dalbergia paniculata.*
Palai	*Wrightia tinctoria.*
Pali	*Dichopsis elliptica.*
Papatan	*Webera corymbosa.*
Parambai	*Acacia ferruginea.*
Parandai	*Vitis quadrangularis.*
Pathiri	*Stereospermum zylocarpum.*
Pavetta	*Pavetta hispidula.*
Peemaram (Periyamaram).	*Ailanthus excelsa.*
Perugilei	*Clerodendron infortunatum.*
Perungaca	*Memecylon malabaricum.*
Pila	*Artocarpus integrifolia.*
Pinari	*Sterculia foetida.*
Poochakottai	*Sapindus emarginatus.*
Poola	*Fluggea nicrocarpa.*

Tamil name.	Botanical name.
Poopathiri	*Stereospermum chelonoides.*
Poovam	*Schleichera trijuga.*
Poovarasu	*Thespesia populnea.*
Porasu	*Chloroxylon swietenia.*
Porumbalu	*Linociera malabarica.*
Pulivagai	*Albizzia stipulata.*
Puliyamaram	*Tamarindus indica.*
Pumaruthu	*Lagerstroemia flosreginae.*
Punalikodi	*Derris scandens.*
Punnai	*Dillenia pentagyna.*
Ruthraksham	*Elaeocarpus tuberculatus.*
Sanna thuruka vembu.	*Cipedessa fruticosa.*
Santhana viri	*Lansium anamalayanum.*
Sapathu kalli	*Opuntia dillenii.*
Sarai (Morala)	*Buchanania latifolia.*
Seemapoola	*Eriodendron anfractuosum.*
Seekai	*Acacia concinna.*
Selavagai	*Albizzia odoratissima.*
Semblichi	*Aphania bifoliolata.*
Senni	*Acalypha fruticosa.*
Serankottai	*Semecarpus anacardium.*
Sigappu Indu	*Pterolobium indicum.*
Sirukarai	*Randia malabaricum.*
Soluvam	*Daphniphyllum glaucescens.*
Sorapalai	*Nothopegia colebrookiana.*
Srikonnai	*Calophyllum elatum.*
Sulunthu	*Canthium didymum.*
Sundakai	*Solanum pubescens.*
Surai	*Zizyphus oenoplia.*
Suruli (Nangil)	*Mesua ferrea.*
Tavattuppolavu	*Croton malabaricus.*
Terumai	*Scolopia crenulata.*
Tekku	*Tectona grandis.*
Thadachi	*Grewia tiliaefolia.*
Thali	*Actinodaphne hookeri.*
Thanakku	*Cochlospermum gossypium.*
Thani	*Terminalia belerica.*
Thennamaram	*Cocos nucifera.*
Therani	*Chomelia asiatica.*
Thattankottai	*Strychnos potatorum.*
Thiru kalli	*Euphorbia antiquorum.*
Thorattimul	*Capparis grandiflora.*
Thevarai	*Wendlandia notoniana.*
Tubam	*Vatica roxburghiana.*
Udi (Uthi, Kakausil)	*Odina wodier.*
Unjal	*Albizzia amara.*
Undippanu	*Myristica canarica.*
Unnu	*Grewia asiatica.*
Unnu	*Grewia orientalis.*
Vagai	*Albizzia lebbek.*
Vakkana	*Diospyros affinis.*
Vakkana	*Diospyros montana.*
Valsura	*Walsura piscidia.*
Vangal	*Amoora rohituka.*
Varanga	*Carallia lucida.*
Vatta	*Macaranga peltata.*
Vatta	*Macaranga roxburghii.*
Vazala	*Poeciloneuron indicum.*
Vazhai	*Musaparad sisera.*
Vedathala	*Dichrostachys cinerea.*
Vedipila	*Cullenia excelsa.*
Vekkali	*Anogeissus latifolia.*
Vellagil	*Dysoxylum malabaricum.*
Vella indu	*Acacia pennata.*
Vella kundrikam	*Vateria indica.*
Vella marudu (Pilla-marudu).	*Terminalia paniculata.*
Vella thanaku	*Gyrocarpus (Americanus jacquini).*
Vellaikadambu	*Anthocephalus cadamba.*
Vellelembu	*Hemicyclia elata.*
Velvagai	*Albizzia procera.*
Velvelam	*Acacia leucophloea.*
Vembadum	*Ventilago madraspatana.*
Vengai	*Pterocarpus marsupium.*
Vennalankodi	*Hiptage madablota.*
Venteak	*Lagerstroemia lanceolata.*
Veppam	*Azadirachta indica.*
Veppoola	*Fluggea leucopyrus.*
Vilankai	*Feronia elephantum.*
Virali	*Dodonaea viscosa.*
Virusham	*Cordia myxa.*
Vittil	*Aporosa lindleyana.*
Veeran	*Hemicyclia sepiaria.*
Yelandai	*Zizyphus jujuba.*
Yetti	*Strychnos nux-vomica.*

Proceedings of the Chief Conservator of Forests

Proceedings No. 451, Press, 27th November 1941

Working Plan—Coimbatore South Division—Sanctioned.

W. G. DYSON, Esq., I.F.S.,
Chief Conservator of Forests.

Proceedings— No. 451, Press, dated 27th November 1941.

Sanctioned.

The prescriptions for artificial regeneration in fuel areas will be considered to have been superseded by the instructions issued in Chief Conservator's Proceedings Mis. No. 31, dated 17th January 1941.

W. G. DYSON,
Chief Conservator of Forests.

To the Conservator of Forests, Coimbatore Circle, Coimbatore.
,, District Forest Officer, Coimbatore South Division, Coimbatore.
,, Collector of Coimbatore, Coimbatore.
,, Collector of Malabar, Calicut.

Copy to other Conservators of Forests
,, the Provincial Silviculturist, Ootacamund
,, the President, Forest Research Institute, Dehra Dun
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